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MOTOR AGE

WHEN ONE FIRST GETS THE NEW MOTOR CAR

"IN ACTUAL DRIVING OF THE CAR THE BEGINNER SHOULD REMEMBER CONFIDENCE IS HALF THE BATTLE"

THE prospects of an early spring have thoroughly stirred up the 1910 crop of motoring recruits, and the lot of the dealer is no longer an easy one. Customers who in the heart of the winter stipulated that a May delivery would suit them, have caught the fever since the breaking up of winter and are urging and pleading that they get their cars from 1 to 2 months sooner than the order calls for. Of course this puts the dealer in a quandary, for he mapped out his delivery scheme at the time the orders came in, and at this late day it is hard to get the factory to increase or rush the orders. Some of the beginners are being accommodated, but they are few and far between.

Those lucky enough to get their cars early are preparing for the roads just as soon as reports from the country tell of the opening of motor navigation. Of course it is not imperative to do much touring at this season of the year, for the city streets always are in good condition, comparatively speaking, after the snow gets off the ground. It is because of this fact that the recruits are so eager to begin their motoring careers. But this starting out as an operator of a motor car is preceded by a number of preliminaries that the wise recruit will attend to before beginning his novitiate. First of all and most important of all, he will insure his car against fire or theft; next, he will take out his state license, if the commonwealth in which he resides requires this; then he will study carefully the instruction book prepared by the concern from which he has purchased his car; and then he will begin to think of learning to actually drive. That taken up and mastered after a few lessons, he becomes an enthusiastic motorist, rather green as to experience, but eager to become initiated in the joys of the sport of which he has dreamed all winter.

Insuring the car is of far greater importance than one might suppose. It is a necessity, an anchor to the windward. Delivery of the car should not be accepted until the new owner protects himself by an insurance policy, for there is no telling just what will happen

"Customers Who in the Heart of Winter Stipulated That a May Delivery Would Suit Them Have Caught the Fever"

in the way of fire or theft, and in this case an ounce of prevention is worth a pound of cure in more ways than one, and a new owner armed with an insurance policy has a great load taken off his mind.

Various Kinds of Insurance

There are various kinds of insurance on motor cars. Some cover only loss by fire and theft; while others cover personal injury, personal injury to others, liability for property damage and liability for damage done a car in a collision. It is not necessary or at least it is not considered so by a great majority, to cover oneself with all these varieties. The common practice is to take out a fire and theft policy which can be had at the universal rate of $2 per $100 per year. The price charged for the other policies varies according to the horsepower and size of the car. For instance, a policy covering personal injury done to others can be had for $35 a year on a 12-horsepower car from one company, $63 a year on a 30-horsepower car and $91 a year on a 50-horsepower car. This policy protects the owner for damages up to $5,000 when only one person is injured, while if more than one are injured the policy is stretched to cover $10,000 damage. For a policy for liability against property damage the rates range from $10 to $22.75 for the first $1,000, from $13.50 to $31.85 for $2,000, and from $24 to $59 for $5,000. The rates for a policy covering liabilities against damage done to the car by a collision run from $20 to $50 per $1,000, but in this instance the price is regulated by each individual car. A limousine of 40-horsepower can be insured for $50, and a touring car of the same horsepower for $70, it being figured that the latter is far more apt to be injured than the slower-moving limousine which generally is driven in the city only. Another policy covers injury to the owner of the car, who can be protected for the sum of $25 per $1,000.

"Study the Instruction Book"

In case an owner desired to take out insurance covering himself in all directions it would cost him $183.75 a year for a 30-horsepower car valued at $2,000. He would pay $63 for the personal injury to others clause, $15.75 for the policy against damage to property, $40 for the collision clause, $40 for fire and theft, and $25 for personal injuries.

Next Step the License

With the car insured, the next step is to procure the license for operating the machine upon the public highways. It all depends upon where a person resides just what step to take in this matter. In some places state registration is required, while in others the commonwealth does not have anything to say about it, leaving the matter up to each individual city or town. However, in the majority of cases it will be found necessary to pay the fee to the state. New York charges a registration of $2 and only the chauffeur is required to take out a license to operate a car. A non-resident of the state is not required to register providing he displays the registration number granted by his own state. The non-resident chauffeur, however, is not exempt from the tax. In New Jersey the fees are according to horsepower rating, ranging from $3 for a 10-horsepower car up to $10 for a 30-horsepower or more. All operators of cars, owners and chauffeurs alike, have to register, the fee being $2 for a car less than 30 horsepower and $4 for a car of 30 horsepower or more. Non-resident's are not exempt except under special driver's license, which remains in

"Those Lucky Enough to Get Their Cars Early are Preparing for the Road"

"First of All and Most Important of All He Will Insure His Car Against Fire and Theft; Next He Will Take Out His State License"

force for 8 consecutive days or for periods of 2 days each, the license being issued by the commissioner or his appointed deputy for $1. In Massachusetts the registration fees are graded according to horsepower—$5 for 20 horsepower, $10 for 20 to 30, $15 for 30 to 40, $20 for 40 to 50 and $25 for 50 and over. All operators are licensed annually, the original fee being $2 and the renewal fee 50 cents. The examination of the candidate costs $2. Non-residents are exempt for a period not exceeding 10 days. In Pennsylvania the horsepower grading also is used, the rates being about the same as those of Massachusetts. Only chauffeurs have to be licensed and non-residents are exempt for a period of 10 days.

Michigan has a new law which necessitates the payment of a $3 registration fee, and chauffeurs being the only ones required to take out a license. A tourist is exempt as long as he carries his own state number. Indiana charges $1 registration fee and does not require either owner or chauffeur to be licensed, and, like Michigan, places no restriction on the tourist other than that he shall carry a state number. Illinois is much the same except that the annual fee for registration is $2 and the chauffeur has to take out a license. All the motor vehicle laws of the various states have provisions requiring caution in passing vehicles and stopping on signals for frightened horses or other draft animals and the observance of the usual rules of the road.

Speed Laws Vary

Speed laws in the various states which have motor regulations do not vary much, usually being 10 miles an hour in the business section, 15 miles an hour in the residential part of the town and 20 miles an hour in the open country. Some of them, however, are more arbitrary, Alabama being one of them. In this state the limit is 8 miles an hour. California says 10, 15 and 20, while Connecticut allows a reasonable and proper rate, having regard for the traffic and the width of the highway. Delaware allows 12 miles an hour on the highways where the houses are scattered and 20 miles an hour in the open. The District of Columbia specifies 12 miles an hour within fire limits, 15 miles in parks, 8 miles on crossings and 20 miles outside the fire limits. Florida says a "reasonable and proper rate" and makes no definite stipulation. Illinois has 10, 15 and 20 and Indiana 8, 15 and 20. New Hampshire permits 8 miles in town and 20 miles elsewhere. New Jersey has 8, 12 and 15 and New York 10, 15 and 20 North Carolina allows 8, 12 and 25, and North Dakota 8 in town and 25 outside.

Minnesota Is Liberal

Minnesota allows a 25-mile gait except at danger points, and Missouri restricts the motorists to 6, 10 and 15. Montana has 8 and 20 for the extremes, and Nebraska 10, 15 and 20. Ohio also has 8, 15 and 20, and Oregon 8 and 24. Pennsylvania holds motorists to 12 miles an hour where signs are posted and 24 miles elsewhere. Rhode Island has 15 and 25, South Caroline 6 and 15, South Dakota 10, 15 and 20, Tennessee allows 20 miles but gives the cities the right to make lower rates within their limits. Texas has 8 and 18 and Utah 10, 15 and 20. Vermont permits 10 and 25, Virginia 8 and 15, Washington 12 and 24, while West Virginia has no speed provision in its statutes. Wisconsin says 12 miles inside of city or village limits and 25 miles elsewhere.

These formalities gone through with, the new owner now prepares himself for motoring activity. First of all he must have a place in which he can store his car. This is a most serious proposition in many cases, especially in a large city where the old-fashioned barn is not easily had and where the garage rates often put a damper on an owner's enthusiasm. However, if one can afford it and lives within easy walking distance of a garage, the solution of the problem is an easy one. By using the garage he saves himself much work and annoyance, but of course it costs money to get such luxury.

For a stipulated sum per month the garage man will store the car and wash and polish it. He also stands ready to supply the motor with gasoline and oil at retail rates, but he does not undertake to look after the mechanical condition of the machine ex-

"The District of Columbia Specifies 12 Miles an Hour Inside the Fire Limits"

"On the Other Hand, There Is the Drawback That in Winter He Is Greatly Inconvenienced by the Cold Weather"

cept upon orders from the owner. In that event he usually charges so much per hour for his work, ranging from 60 cents to 75 cents per hour. His garaging rates vary according to the size of the car, and as to whether or not the owner desires the car cleaned and polished every day. In case this washing and polishing daily is not stipulated the rates are much lower and range from $5 and $6 a month for a small runabout up to $15 and $20 for a larger machine. With the washing and polishing included the prices are more than doubled. But the luxury of keeping a car in a garage is one that is appreciated by the busy man. He finds the place open at all hours of the day and night, an attendant always is ready to supply him with oil and fuel, and a small tip to the man on the floor will see that the tires are kept inflated properly and the side and tail lamps filled with kerosene.

Garaging the Car

The man who uses a barn for his garage saves considerable money. In many cases the barn is on his own property and therefore costs him nothing, while in case he has to rent one in his own neighborhood the rent generally is so low as to be hardly noticeable. In a large city a good barn can be secured for $5 or $6 a month, a building which is capable of holding two or three machines, so that if the motorist so desires he can sublease this space and thus bring his own rental down to a minimum amount. Or he can double up with someone else and enjoy the same privileges. On the other hand, there is the drawback that in winter he is greatly inconvenienced by the cold weather, which not only endangers his motor because of the liability of the water freezing in the cooling system, but he also experiences considerable difficulty in starting his motor after it has stood all night in the barn. Some motorists rent a barn for summer use and store the car in a warm garage during the winter months. This brings the cost up a trifle, but it is probable that it is the wisest act after all, especially if one drives all winter.

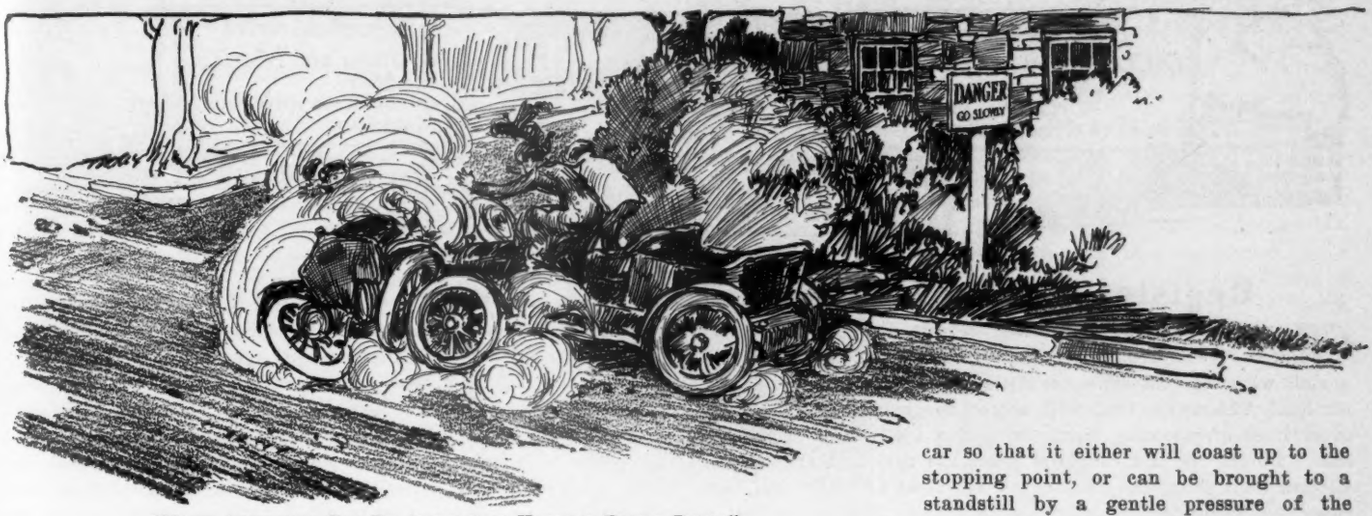
The economical motorist can save almost half his gasoline bill by installing his own gasoline storage system. Either he can buy this outright or he can exercise a little ingenuity and put in a home-made product. It is an easy matter to secure an old hot-water boiler, connect two gas pipes to it, one for admitting air to prevent a vacuum as the gasoline is drawn out, while the other is used to pump out the fuel. The gasoline can be drawn from this improvised tank by a tin suction pump, and the total cost of the outfit is not more than $6 or $7. Equipped with provisions for storing the fluid, arrangements can be made with the gasoline wagon that daily goes through the neighborhood and the fuel secured at the same rates as are paid by the garage men. Also economy can be practiced by buying oil in large quantities, which can be bought wholesale and stored in one's basement.

Now the new owner is about ready to become a motorist in reality, but first he should brush up on the prevailing rules of the road, unwritten laws in many instances, but courtesies which should be observed—a sort of a "do unto others as you would have others do unto you" proposition. Many accidents can be avoided by heeding these rules. First of all it should be remembered that all vehicles in this country keep to the right, that no one has the privilege of cutting in between the curb and another vehicle going in the same direction, for if one does so he does it at his own risk and cannot recover damages in case of an accident. In the business district of a big city it is not permissible to turn around in the middle of a block, the driver being required to go to the next corner and turn around the middle of the intersecting streets. Also he is not permitted to leave his car standing with the left side to the curb. In turning corners he should be extremely cautious and look around to see if any vehicle is approaching him. In case one is, an arm should be raised in the air to warn the other fellow that either a turn is to be made or the car is coming to a stop.

Blowing of the Horn

While the motorist is not a musician he must learn when and where to blow his horn. In some states the law requires that a horn be blown at each street intersection, but unless one happens to land in a nest of motorphobes this generally is not enforced, it being realized by the authorities of many cities and towns that most motorists use discretion. Indiscriminate blowing of horns only confuses pedes-

"Gasoline Can Be Drawn From This Improvised Tank"



"MANY ACCIDENTS CAN BE AVOIDED BY HEEDING THESE RULES"

trians and arouses enmity against motorists among the residents of the street used by the motor cars. Often a good driver will go miles without touching his horn. He generally is a cautious pilot who slows at corners when he sees pedestrians about to cross, and who only toots the horn when necessity demands. There is an art about blowing the horn that should be learned. Most pedestrians imagine the instrument is designed only to order them off the thoroughfares, whereas it really is intended as a warning of approach. Therefore a gentle toot of the "please look out" order will do far more good than the loud aggressive honk-honk of the ignorant or haughty driver.

Taking the First Lesson

When it comes time to go out and take the first lesson in actually driving the car the beginner should remember that confidence is half the battle, that if one keeps his nerve and does not become rattled he will have little trouble in mastering the art. Of course there are lots of self-taught drivers, but, on the other hand, it is best to have someone of experience along even if he does nothing more than sit in the other seat and give advice. He can tell the uses of the various levers and can caution the amateur at times when congestion of traffic may bring about trouble if the beginner has to watch other vehicles and his levers at the same time. It is best to seek some quiet road for the first lesson and after 30 minutes or so of practice in the art of shifting gears and operating the clutch a novice can venture out into the motoring world. Many of them learn quickly and while it might be possible for some of them to drive most anywhere in the city after one lesson still it is far better to go slowly. One should not venture into the business district in the town or city in which he resides the first day out, nor the second either for that matter, but should practice in the outskirts for two or three afternoons until he is satisfied that he has conquered.

There should be no foolhardy attempts to try the speed of the new car at the beginning, for such practice always gets the novice into trouble. In fact, it is far better to do the preliminary skirmishing on the second gear and thus avoid the temptation to shatter the speed limit. While the beginner is about it he also should learn how to use his brakes, a valuable lesson which if well learned effects a great saving in tires. There should be no grand stand flourishes such as often are witnessed on the part generally of chauffeurs of dashing up to the point where it is desired to stop and then slam on the brakes to the detriment of the tires. Instead one should use the throttle and spark levers to slow the car so that it either will coast up to the stopping point, or can be brought to a standstill by a gentle pressure of the brakes, which does no damage to the tires.

"A DIRTY SPARK PLUG"

A common failing among beginners is forgetfulness as to watching the gasoline supply, the oil and the water, which neglect often gets them into trouble. Garage men tell many funny stories of trifling troubles which look as big as mountains to the novice which easily could be avoided if a common sense diagnosis is made before the garage man is appealed to. One hears of the new driver who finds that his radiator is leaking so badly that he cannot keep any water in it and the engine becomes overheated, but which upon investigation proves to have been caused by the owner leaving open a petcock which drains the cooling system. Another finds he cannot start his motor and he cannot understand the reason. The garageman comes along, looks in the tank and finds there is no gasoline. Another common failing is to leave the gears in mesh so that it is almost impossible to turn the motor over. Then, again, another beginner will use his battery box for the

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"A COMMON FAILING AMONG BEGINNERS IS FORGETFULNESS IN WATCHING THE GASOLINE SUPPLY"

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Registering Car Models

ONE of the features of the new contest rules for this season is that compelling manufacturers to register their 1910 models with the contest board of the American Automobile Association. The value that will accrue to racing, reliability and other lines of motoring sports from this action will be inestimable. During the last couple of years the various technical committees throughout the country on occasions of hill-climbs, road races, track meets and reliabilty runs have done their best to insure nothing but stock cars in competitions, but their task has been a herculean one, not so much because of not being able to examine the cars and discover certain features about them as to not knowing exactly what constituted a stock model of any particular make. According to the new registration form, each maker has to answer more than 100 questions regarding each of his models and make affidavit to the statements. These registration forms are then deposited with the contest board of the A. A. A., and whenever a contest takes place duplicates of these registration forms properly filled out will be forwarded to the promoter of the contest so that the technical committee in charge has something definite to go by and can determine exactly whether a certain contesting car in an event is a legitimate stock model or not so far as the details of construction are concerned.

FROM experience gained last year it was quickly discovered that not only are some managers of racing squadrons dishonest, but actually officers in some companies making motor cars are dishonest and have not hesitated to make written statements regarding certain features of construction which events have since proven were false. It is because of this condition of affairs, this lack of honor in some quarters, that such additional precautions as registering the different models have been taken, and now if the makers are compelled to live up to this standard the possibility of deception will be reduced more than one-half.

THE question of maintaining a strict observance of the stock-car status depends to a great extent on the car manufacturers themselves. Some of them will object to filling out certain details of these registration blanks as they have always done when certain questions have been asked, and yet these same makers will be the first to complain if any rival maker exhibits a symptom of deception. Rival racing teams in the racing season are often as jealous of one another as musicians and yet one or the other of them will actually object to doing certain things that are intended expressly for his individual protection. It is only by the co-operation of the makers that genuine stock-car contests can be obtained and every maker, be he big or small, should enter into this stock-car registration business in a whole-hearted manner, and instead of being a hindrance should be a pusher of it.

SOME manufacturers have in times past failed, or at least hesitated, in filling out similar registration blanks because they imagined the information would be given to some rival manufacturer so that he could profit by their experiences. This never has and never will be the case. Not a rival manufacturer will ever have an opportunity to see these registration blanks. They are intended solely for the contest board to be delivered to the technical boards in whatever parts of the country desired and are not to be placed in the hands of manufacturers.

Early 1911 Models

FROM present indications it appears that the 1911 season will be a little earlier than was the present season, and those who are looking for a next year model will not have to wait long after summer has arrived before it will be possible for them to gratify their desires, especially with some makes of cars. From factories all over the country comes the information that the 1911 models are well under way and in others these models have been on the road for months going through their final stages of preliminary testing, so that once the new model is launched there will not have to be a single change made from the delivery of the first car of that model until the last one has been shipped from the factory. This settlement of design is one of the greatest values of early models and is a great benefit to the industry.

MOTOR AGE readers well remember conditions a few years ago when many manufacturers did not have their new models ready until the show circuit opened and often then shipped cars to the shows without crankshafts and other very necessary internal requisites. Those readers also may remember the aftermath of such shows, how the maker saw something newer at the show than he had incorporated in his machine and so dispatched his designing squadron back post haste to the factory to redesign the car. In every case the result was that it was spring before a satisfactory model was ready, and by that time the progressive maker had his model for the following season ready, so our poor procrastinating maker was as far if not farther back than ever. Those were the days of one or two engineers and when the others were mere copyists, making what the other fellow had, not because they thought or knew it was the best thing for the car, but simply because the other fellow had it. These days of copying are almost over, and a good thing it is for the industry. Designers and makers have learned that because the highest priced cars in the country have T head cylinders is not a just reason why it is impossible to build a satisfactory small car with an L type of cylinder. The great public has reasoned that all humanity has never worn the same cut of coat at the same time, but that all have served their purpose and that one in its particular field is just as good as the other in its field. So in the car field designers and makers are in several cases beginning to stand on their own legs and beginning to walk alone, and it is a good thing and a great benefit to the industry. If these designers had gained confidence enough 6 years ago to try to at least creep or walk alone the makers employing them in many cases would have been better off; but then again there were those following their own bent to certain destruction, when a good slice from a well-designed car would have saved the day and the factory as well.

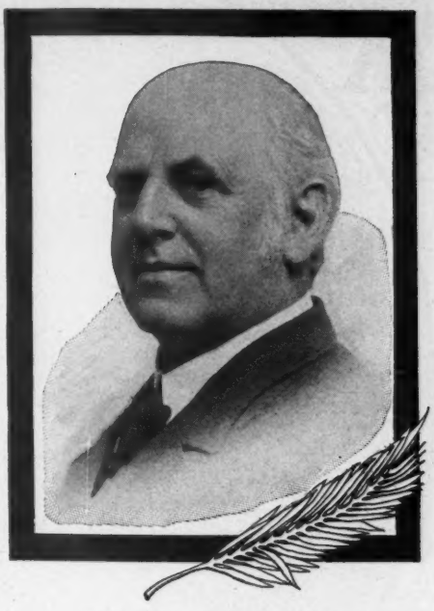
IT is cheap for a factory to bring out an early model for the following year. In the first place it is easier to sell a new model when the other maker is trying to get rid of his holdovers than it is to market the new one months after your next-door maker has had his in the field. An early model means a settled model, and there is nothing more expensive or disorganizing than having to shut down sections of the factory during the season because a part of the car is under-strength and a new stock has to be secured and the old stock junked. Such conditions often happen when a factory is a month or 2 behind the leaders. Such work is expensive and disheartening.

TAXES WORRY FRENCH—DEATH OF G. N. PIERCE

PARIS, March 15—Menaced with increased taxation all round, motor car manufacturers, dealers and private owners, are preparing a substantial protest against the proposals of the government. Unfortunately they only awakened to the importance of the new budget proposals when these were presented to the senate for approval, and cannot protest with the same effectiveness as if the matter were only before the lower house.

The fixed taxes applied in France remain the same, but for every horsepower above 12 the government proposes to create taxes on an increasing scale, thus making the owning of a high-powered car a very costly matter. The taxes, too, apply not only to private touring cars, but to taxicabs, hiring cars, and commercial vehicles. Strangers visiting France for the purpose of touring also are singled out for contribution to the exchequer. The original proposal was that any car brought into the country for more than 10 days should pay taxes. On the protest of the Touring Club of France the Chambre des Deputes extended the period to 1 month. Even this, however, does not satisfy the club, and together with the touring commission of the Automobile Club of France they are tackling every senator with a view to the entire removal of the proposed tax.

In its letter the Automobile Club of France points out that for years efforts have been made to simplify and encourage international touring. The various nations of Europe recently have arrived at an understanding on driving and car licenses; by the establishment of the triptyque they have simplified customs formalities, they are within a short distance of obtaining uniform road rules and danger signals—and as a setback the French government comes forward with a tax that will drive away motorists bringing thousands of dollars annually into the country. The only result of the tax will be that owners of cars will arrange to leave France on the thirtieth day, in order to avoid the formalities and annoyance of the tax; thus



THE LATE GEORGE N. PIERCE

the losers will be hotel proprietors, garage men, accessory dealers, and all those connected with the touring and motor car business. The tax will be difficult to collect and will bring very little money to the government. Hirers of touring cars, who do a large business among residents and foreign visitors, also have sent in a joint protest to the senate.

Taxation always has been heavy in France, and under the new regulations it will cost more to maintain a motor car in Paris than in any other country in the world. A 24-horsepower car in Paris pays about $330 a year in direct and indirect taxation. This amount is composed of $18 fixed tax, $28 horsepower tax to the state, the same amount to the city of Paris, and in addition a tax of 6 cents a liter on gasoline, of which 2 cents go to the state and 4 cents to the city. Calculating on the car being used only 100 days a year, the amount of gasoline tax would be not less than $240.

BUFFALO, N. Y., March 28—The funeral of George N. Pierce, who died last Wednesday at his apartments at the Lenox hotel here, was held on Saturday and was private. Mr. Pierce was the founder of the Pierce-Arrow Motor Car Co. Heart failure caused his death. Mr. Pierce began his business career as a member of the firm of Heintz, Pierce & Munschauer, organized in 1872 to manufacture bird cages and refrigerators. From this he went into the manufacture of bicycles. In 1898 Mr. Pierce began experimenting with motor cars and in 1901 the George N. Pierce Co. placed the Pierce motorette on the market. In 1906 Mr. Pierce transferred his active interest in the bicycle business to Percy P. Pierce, and in 1907 the George N. Pierce Co. was reorganized. Mr. Pierce's interests were bought out, it is understood, and George K. Birge succeeded him as president and William B. Hoyt as director. About 2 years later the George N. Pierce Co. became known as the Pierce-Arrow Motor Car Co. After his retirement from active business, Mr. Pierce lived by turns on a ranch in the west, at his summer home at Sturgeon Point, and at the Lenox hotel. He was 64 years old but appeared to be hale and active. He was a member of the North Presbyterian church and of the chamber of commerce and other organizations. He was born in Friendsville, N. Y. He is survived by his wife, six daughters and two sons.

The board of directors of the Pierce-Arrow Motor Car Co., at a special meeting held on the day following the death of Mr. Pierce, adopted as a token of their regret the following resolution, which was sent to the family:

The officers and directors of the Pierce-Arrow Motor Car Co. desire to express their bereavement in the death of their former president and associate. From 1896 to 1908 this business bore his name, and relations were intimate and cordial. Mr. Pierce's retirement was due to a desire to enjoy with his family his remaining years in well-earned ease and pleasure. That they were so few is a profound regret. The sympathy of his long-time associates is respectfully tendered to his bereaved wife and children.

WHEN ONE FIRST GETS THE NEW MOTOR CAR

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carrying of keys, tire irons, etc., and short-circuits result.

Of course one cannot learn everything about engine construction in a day, but before the beginner starts upon his career he should become well grounded in a few common-sense facts. He should learn the symptoms of a low gasoline supply, he should know when his engine is crying for more oil, he should be able to detect a dirty spark plug and he should know how to remedy these minor troubles. An engine knock may be caused by the spark being advanced too far. This is the most common of all, especially when a beginner is concerned, the tendency being to shove the lever up as far as it will go. Then, again, a dirty spark plug may be the cause of it, or it may be an overheated engine, the lack of lubrication or loose connecting rods. When an engine runs sluggishly, hits on two or three cylinders and has no speed, one can begin to suspect that maybe the supply of oil is running low. These same symptoms also may be caused by a storage battery that is exhausted or short-circuited, or on which the nuts are either not tightened or are corroded.

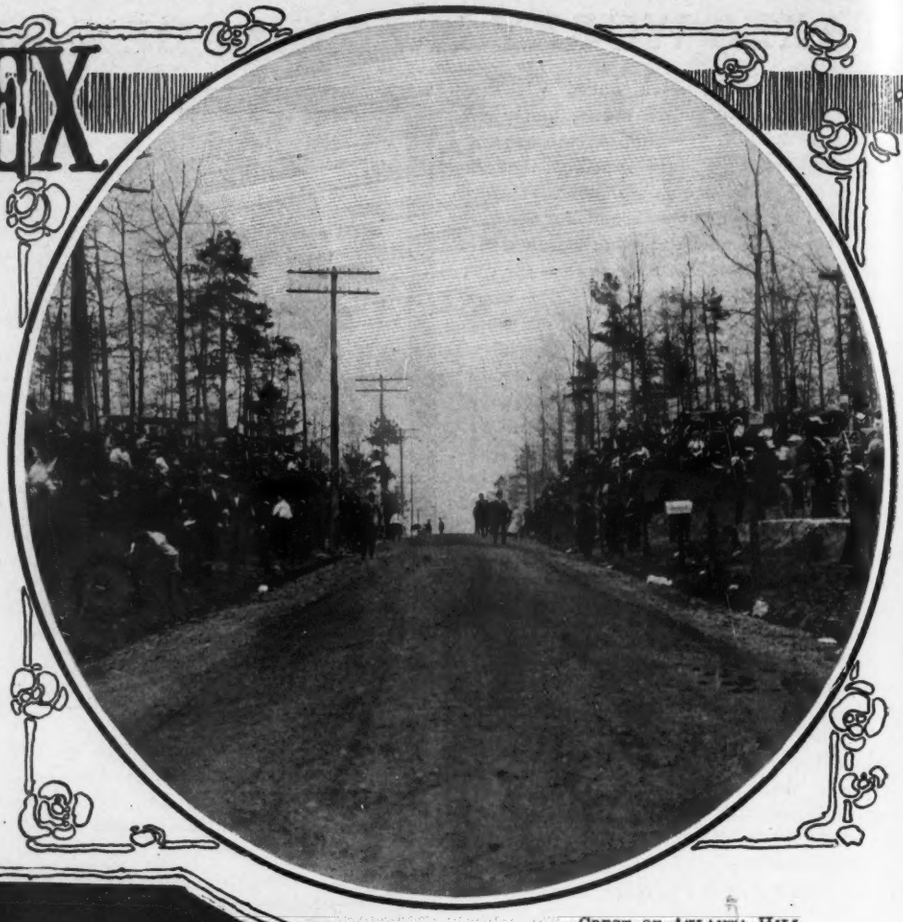
When one hears a popping in the carbureter accompanied by a loss of power it generally can be set down to too weak a mixture, the intake valve spring may be weak or the valve itself may slip open. One also can take this popping noise as an indication of little gasoline in the tank. In fact, this popping in such a case as the latter is a sort of an alarm clock to warn the motorist. However, it generally does not sound its warning in time to do much good, for by this time there isn't enough fuel left to carry a car more than a quarter or a half mile, the supply consisting only of what is in the carbureter bowl.

But one should not expect to learn everything about a motor car in a minute and the novice will find that after all experience is the best teacher, that what seems a mystery at first is as an open book in a short while.

The SIMPLEX

ATLANTA, GA., March 26—When a Simplex car came sizzling up the Stewart avenue hill about sunset tonight and dashed wildly over the crest of the grade and a mile or so down the other side it brought to an end the fourth annual hill-climb of the Fulton County Automobile Association and incidentally it hung up the fastest time ever made by a gasoline car on the hill and put the third and last leg on the Atlanta Journal cup.

The affair was much after the order of other Atlanta hill-climbs—the long, sweltering stretch of macadamized road, a drove of cars at the bottom, a crowd of spectators at the top, a timing apparatus that didn't work well and every few minutes a car sweeping and dashing up the stretch of road and the loud, megaphonic shrieks of the announcer giving the time. It began with the usual lunch parties up and down the wooded sides of the hill. Then came a desperate struggle with a highly refractory timing apparatus.



CREST OF ATLANTA HILL

WHITE STAR, ATLANTA-MADE CAR, WINS ITS CLASS
SCENE AT FOOT OF HILL USED FOR CLIMB

It hardly could be said with truth that, even as these uphill fights against time go, it was particularly exciting. Only once was there a real contest, and that was in the two-car class for machines of $4,000 and over, when J. D. Rhodes' Packard defeated W. L. Dunn's 1907 Stearns by 1:04⅘ to 1:05⅗. Otherwise all races were won by comparatively wide margins. Of course the free-for-all was the feature of the day and it proved a closer contest than might have been judged by the list of entries. Ed Inman's Simplex, driven by A. R. Almand, won rather handily, covering the .88 mile in 47⅘ seconds, just 2 seconds slower than the time made last year by the White steamer.

The really marvelous run of the day was made by John F. Toole with a 40-horse-power Knox. He had this car tuned up to high C and drove it up in :50⅕, the best time ever made on the hill by a car of anywhere near that power.

Of very considerable local interest was the victory of the White Star, an Atlanta-made machine in class 3. Driven by Charles E. Jones, it covered the course in 1:15⅗, just ⅗ second slower than an E-M-F did in the same class. Both cars protested, but only that of the White Star was sustained and the E-M-F was declared out for running without lamps or mud-guards. This disqualification was the result of hard luck, for the E-M-F tuned up to enter the contest burned out its wiring not ½ hour before the start was due and

ATLANTA STAR

KNOX IN FREE-FOR-ALL

it was necessary to secure another one and use it instead. A Krit was the winner in the class for cars under $800 and the Buick 10 had things its own way in class 2. Summaries:

Car and Driver	Time
CLASS 1, $800 AND UNDER	
Krit, C. F. Wolfe	1:25
Hupmobile, K. T. McKinstry	1:31
Metz, D. R. Miller	3:43
CLASS 2, $801-$1,200	
Buick, L. E. Fain	1:07
Warren-Detroit, J. E. Darby	1:15⅛
Ford, M. W. Venable	1:19
Mitchell, R. C. Howard	1:26⅜
Cameron, G. F. Hardy	1:31
Cameron, J. B. Wall	2:16
CLASS 3, $1,201-$1,600	
White Star, C. E. Jones	1:15⅜
Buick, P. O. Parmalee	1:18⅜
Parry, P. C. Schultz	1:28⅜
*E-M-F, H. L. Cohen	1:15
CLASS 4, $1,601-$2,000	
Buick, W. Oldknow	:57⅜
Buick	1:02
Buick, L. E. Fain	1:03⅜
Pullman, R. T. Peckham	1:13
Buick, T. B. Dial	1:15
Inter-State, A. R. Brown	1:15⅜
CLASS 5, $2,001-$3,000	
National, W. J. Stoddard	:58
Knox, L. La Blanche	1:07⅛
Marmon, W. T. Candler	1:09⅜
Pope-Hartford, A. W. Kirk	1:13
Selden, R. G. Young	1:20⅜
CLASS 6, $4,000 AND OVER	
Packard, C. C. Rooney	1:04⅝
Stearns, W. L. Dunn	1:05⅜
FREE-FOR-ALL	
Simplex, A. R. Almand	:47⅘
Knox, J. F. Toole	:50⅕
National, W. J. Stoddard	:55⅕
Pope-Hartford, A. R. Almand	1:03⅕

* Disqualified for lack of lamps and mudguards

ATLANTA SPEEDWAY CARD

Atlanta, Ga., March 26—With $5,100 and eleven cups of various values offered for the winners, there should be some entertaining events at the spring meeting of the Atlanta Automobile Association over the speedway track May 5, 6 and 7. The list of events has just been issued and it is patterned along the lines of the card of last fall over the Atlanta track, except that it is more modest in length and in prizes.

TEXAS MOTOR ROAD PLANNED

Houston, Tex., March 27—Plans are on foot in which both Galveston and Houston people are interested, for a motor speedway. Not only are owners of these two cities interested in the course, but manufacturers of cars have signified their intention in several instances of backing the proposition. It is proposed that a speedway costing something like $500,000 be constructed paralleling the inter-urban electric line or one of the railroad lines between Galveston and Houston, the driveway to be exclusively for motor cars and motor cycles. It is proposed that the driveway will be 100 feet in width.

KRIT, WHICH WON CLASS FOR LITTLE CARS
BUICK MODEL 10, ONE OF THE WINNERS AT ATLANTA

How the Pittsburg Show in Duquesne Garden Looked the Opening Night

Pittsburg's Annual Motor Show

PITTSBURG, PA., March 28—Classy is the word that best describes the fourth annual show, which opened in Duquesne garden last Saturday night and which will close the evening of April 2. Comparing this show with the first event of the kind, which was held 4 years ago, the visitor is impressed with the tremendous improvement made in motor car manufacturing and still more forcibly by the wonderful increase in the interest in Greater Pittsburg. Nearly 5,000 spectators clicked through the turnstiles at the garden on Saturday night.

The view which greeted the thousands of visitors amply repaid them for their trip. The garden was draped throughout in the show colors, gold, canary and white. The radiant brilliancy of the electric display set off this beautiful drapery to splendid advantage and also brought to the notice of the first-nighter the immense floral display, which far exceeds anything of the kind ever seen in the garden. With hundreds of palms and bay trees, monster hanging baskets of flowers and big displays of cut flowers in the different booths the show place is turned into a garden.

Artistic Decorations

Exhibitors are fortunate this year in being clearly discerned. In front of every booth is a monster bronze art glass electric light dome suspended from the ceiling by wrought bronze chains.

The Pittsburg show is the result of unusual effort on the part of the committee, which is composed of F. D. Saupp, of the Hiland Automobile Co., chairman; G. P. Moore, of the Keystone Automobile Co.; James R. Newell, of the Wilkinsburg Automobile Garage; and W. N. Murray, of the Standard Automobile Co., who is president of the Pittsburg Automobile Dealers' Association. In the first place the committee spent money on a liberal scale. No show ever held in Pennsylvania has been one-half so well advertised. The show dope usually handed out on such events was put aside and in its place unusual features of real news interest were invented, which are sure to delight the crowds that visit the show this week. Every paper in western Pennsylvania, eastern Ohio and West Virginia received these notices, and the wide publicity which was given to them brought to the show, even on the first night, dozens of country dealers and hundreds of visitors from the big, wealthy towns.

In the way of exhibits several things stand out prominent in this show. First, there are forty more booths provided than ever before, and even with this extra precaution of the show committee more than fifty applications for space were turned away last week. There are 125 different models of cars shown in the pit of Duquesne garden, which also is a big gain in the number over preceding shows. These cars range in price from $7,000 to $450. The display of closed cars is unusually large, and the wonderful advance made in the fine points of finish and comfort already have won for the 1911 models hosts of friends among the early vistors. There is probably one-third more chassis shown than last year. Great interest is manifested by Pittsburgers in the different types of chassis exhibited, for it is becoming known more and more here every year that it pays well to study very carefully the mechanism of the car which is bought for use on Pittsburg's narrow, rough and steep hills and sharp curves.

The display of accessories is considerably larger than last year. These are arranged around the gallery overlooking the pit. The list of accessory exhibitors includes several well-known Pittsburg firms, showing that the accessory and repair business here is growing very rapidly. Tire exhibits are the best ever seen in Pittsburg. Also the displays of mechanical appliances and ornaments are fine and the lamp people come in for a large share of praise because of the unique and attractive displays of their wares.

Advance Made by Pittsburg

Pittsburg has made great strides as a distributing center for accessories during the past year, and several important agencies for western Pennsylvania have been established here, two of them during the past week. The displays of bodies were live centers of interest Saturday night, for two local firms, L. Glesenkamp & Sons Co., and the E. J. Thompson Co., have fine exhibits. The display of the Westinghouse Electric and Mfg. Co., also is one of the attractive features in the accessory line.

In the matter of machines shown the display of commercial trucks is easily the feature of this year's show. So marked is the increase in the number, importance and variety of the exhibits and especially in the great interest manifested, that it is evident that Pittsburg is fast gaining ground as a user of commercial vehicles. Eleven different types of trucks are shown in the front of the garden. These range in price from $2,100 to $4,500, and in size, from an 800-pound delivery wagon to a 5-ton truck. The H. Lange Wagon Co., has by far the largest display of this kind. Other models are shown, by the Packard, White and Overland people, to good ad-

INTERIOR OF DUQUESNE GARDEN IN WHICH PITTSBURG SHOW IS BEING HELD

Remarkable For Its Decorations

vantage. The repair business is well represented at this show. A half dozen large exhibits, by Pittsburg firms which have well-equipped plants here, took up much attention of the sightseers Saturday night.

Prominent among the lessons which the 1910 show teaches is the big gain which has been made during the past 4 years in actual manufacturing of motor cars, trucks and accessories, in this city. When the first show was put on there scarcely was an exhibit of this kind. The present show has displays which prove that in the manufacturing line Pittsburg is coming to the front. The big local concerns are now making bodies in large numbers. Three large Pittsburg firms are manufacturing commercial trucks. A half-dozen concerns are making accessories of different kinds in addition to the repair plants, which are doing all the business they can handle. Two Greater Pittsburg companies also are manufacturing motor cars, and before the next show opens it is predicted that each of these will have at least three models on display. The number of agencies now in Pittsburg is fully double that of 4 years ago. To the shows which have been held here may be attributed chiefly this increase in selling agencies. Manufacturers are present at this show in larger numbers than ever before and these have demonstrated that they appreciate the fast growing importance of Pittsburg as a distributing center for their goods.

A most aggressive campaign is to be waged this week for new agencies. The show committee is placing at the hands of manufacturers every convenience possible in the way of electric connections and exhibition space and these efforts are sure to be rewarded by a lot of new high-class vehicles and improvements introduced in the Pittsburg district. In front of Duquesne garden is a splendid place for exhibition purposes and today duplicates of some of the finest cars in the graden are being brought out and shown to prospective customers.

BIG WEEK FOR HOOSIERS

Indianapolis, Ind., March 29—The Indianapolis Automobile Trade Association has eclipsed former efforts in arranging the annual motor car opening week, which began Monday and will continue until Saturday night, concluding at that time with a banquet at the Denison hotel. Hundreds of visitors are in the city and indications are that the record of sales for any opening week in previous years will be broken.

Each year it is the custom for local members of the motor car trade to set aside 1 week for a formal opening, each concern exhibiting in its own salesroom or factory, but participating in various public events. These individual exhibitions are necessary by reason of the fact that there is no building large enough to accommodate such a combined exhibition as there would be.

The extent of the local industry may be seen readily from the fact that more than ninety concerns are identified with the trade. There are forty-five agencies representing eighty different makes of cars. There are also an even dozen factories for the manufacture of cars, and numerous concerns for the manufacture of parts and accessories, besides branch tire houses, etc.

Monday and today were devoted exclusively to the display of cars in the respective salesrooms and factories, while one of the principal features of the week takes place tomorrow afternoon. This is the floral parade, the first of its kind ever seen in the city.

There will be a number of gymkhana contests at the Indianapolis motor speedway Thursday afternoon, the speedway management having donated the grounds and no admission fee will be charged. Contests will be limited to stock gasoline cars with full catalog equipment. The event will be in six sections.

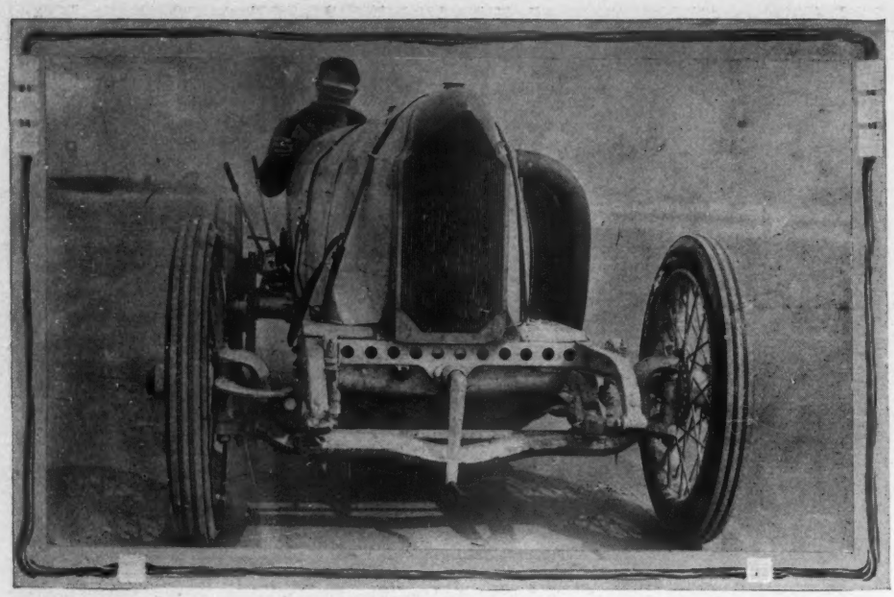
Another event of considerable interest and importance will be the review, or parade of 1910 models.

The opening will conclude Saturday evening with a banquet at the Denison hotel.

Indianapolis, Ind., March 30—Special telegram—In the floral parade today the special features were the Packard truck and the Premier. The first was a white battleship decorated with 1,000 American Beauty roses and carrying a band. The second was a plantation scene—with cabin, cotton field and negroes. The Hupmobile, representing a locomotive, also was good.

SHOW AT SPOKANE

Spokane, Wash., March 26—The first annual show of the Spokane Automobile Club was held in the Princess rink this week. A feature of the opening day was the decorated parade. More than 100 machines were in line. The big hall of the Princess rink made a splendid picture the opening night with its decorations of American flags and bunting together with flowers and potted plants, amid which the exhibits were artistically arranged. All told there were nearly a score of these with about fifty cars of various makes and designs displayed. The color scheme was white and gold.



FRONT VIEW OF BENZ WITH OLDFIELD AT THE WHEEL

Beach Meet Produces New Records

DAYTONA, Fla., March 25—The annual beach meet came to an end yesterday afternoon and the last day was the tamest of them all because of the fact that no records were broken. The weather man was to blame for this, for a drenching rain at noon time put a damper on the sport and the meeting came to an unexpected end. Before the weather man interfered several attacks were made on Barney Oldfield's mile record of :27.33, but it survived the attack, although Oldfield came close to it when he sent his Benz over the course in :27.88. Ben Kerscher, driving the Darracq in which Hemery won the 1906 Vanderbilt, did the distance in :37.34, which really was a clever performance for the old car. Walter Christie took his last whirl as a speed merchant when he piloted the Christie the distance in ::33.15. Christie announces he is through with the racing and that henceforth he will devote all his time and energy to the manufacture of commercial and pleasure vehicles which will employ his front-drive principle.

In addition to the mile trials there were three 10-mile races run. One of them was for 161-230 stock chassis and was won by Pete Hart in a Buick, with Altman in a Hudson second, the time being 12:58. A 10-mile handicap was won by Kerscher, who started scratch in his Darracq, who covered the distance in 7:21. Oldfield in the Knox six was second, and Bond, in a Stearns was third. Altman in a Hudson, Oldfield in the Knox and Kerscher in a Darracq, was the order in the second 10-mile handicap, the time of which was 12:45. The feature event of the day was to have been the 300-mile race, but this was abandoned because of the storm.

Oldfield and his retinue left here today for Los Angeles, where the record-holder will drive in the opening meet of the new board track. Oldfield departs with five new records to his credit—the flying mile in :27.33, equal to 131.72 miles per hour; the standing mile in :40.53, or 88.18 miles per hour; the flying kilometer in :17.04, or 131.28 miles per hour, and the 2-mile in :55.87, or 128.88 miles per hour, all of which were made in the Benz. In the Knox six Oldfield created a new stock car mile record of :40.35, or 88.5 miles per hour.

BOARD TRACK READY

Los Angeles, Cal., March 26—The new mile board track was informally opened on Wednesday. The first mile was made by Hanshue in the Apperson Jackrabbit, the time being :46. Later Hanshue cut this to :44⅘. Nikrent in a Buick did :45⅘, Harroun in a Marmon :49 and Endicott in a Cole :56⅘. Today Caleb Bragg in a 90-horsepower Fiat did a mile in practice in :40⅘.

ST. LOUIS AFTER SPEEDWAY

St. Louis, Mo., March 28—The Million Population Club of this city has launched two propositions which seem destined to do more than anything that has been carried out in the past here to put St. Louis to the front in the motor world. One is the building of a motor speedway at the western city limits. The other is the holding of a national show here in the fall when the good roads convention assembles in this city. The motor speedway is an assured proposition. Plans have already been drafted for a 2-mile track and it will be only a short time until active prepara-

WORLD'S STRAIGHTAWAY RECORDS PAST AND PRESENT AFTER OLDFIELD

NEW RECORDS

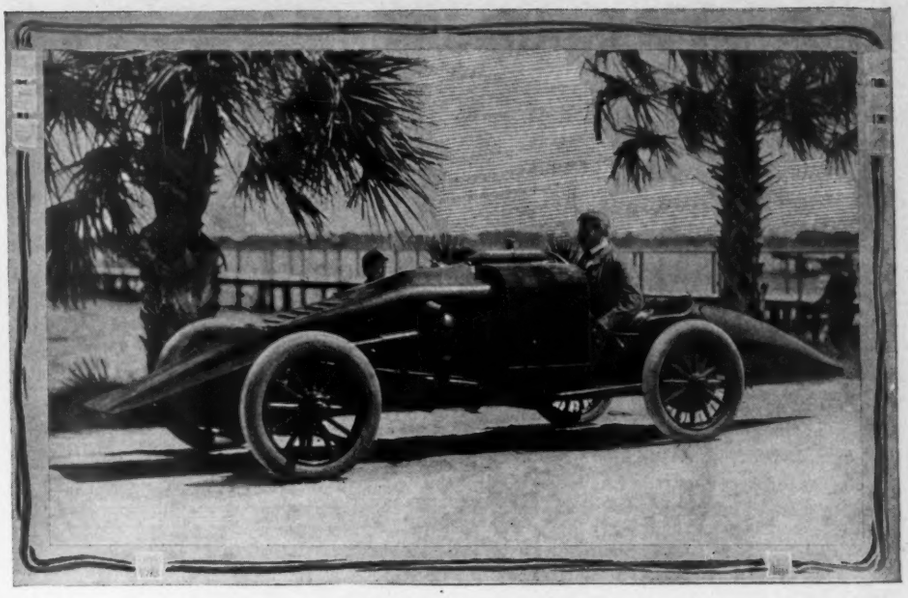
Distance	Type	Time	M.P.H.	Holder
1 kilo, flying	Gasoline	:17.04	131.28	Oldfield, Benz
1 mile, flying	Gasoline	:27.33	131.72	Oldfield, Benz
1 mile, flying	Steam	.....	.....	.....
1 mile, standing	Gasoline	:40.53	88.18	Oldfield, Benz
1 mile, flying, stock car	Gasoline	:40.35	:88 5	Oldfield, Knox
1 mile, amateur	Gasoline	....	.....	.....
2 miles, flying	Gasoline	:55.87	128.88	Oldfield, Benz
5 miles, flying	Gasoline	.....	.....	.....
10 miles, flying	Gasoline	.....	.....	.....
50 miles	Gasoline	.....	.....	.....
100 miles	Gasoline	.....	.....	.....
250 miles	Gasoline	.....	.....	.....

CROWDS ON BEACH AT DAYTONA, FLA., WATCHING OLDFIELD AND OTHERS

tions for the actual construction will be begun. As to the national show arrangements must be made with either the National Association of Automobile Manufacturers or the Association of Licensed Automobile Manufacturers to sanction the event. The St. Louis Million Population Club is a stable organization, and it always does things which it decides to act.

FLORAL PARADE FOR CHICACO

Chicago, March 29—Instead of celebrating the opening of the driving season by a week's carnival, the Chicago Automobile Trade Association at its meeting last night decided to substitute a floral parade to be held on the night of May 7. The carnival feature has been postponed until fall, when the dealers will have more time to handle it. The meeting also discussed the threatened 25 per cent increase in freight rates which the A. L. A. M. now is fighting and a resolution pledging the support of the local association was passed and will be forwarded to the traffic department of the A. L. A. M. Fourteen new members were admitted and the association now comprises about sixty of the most prominent concerns in the city. J. B. Maus, manager of the Pennsylvania tire branch, qualified as secretary, to fill the vacancy caused by the resignation of F. E. Sparks.



CHRISTIE WITH FRONT-DRIVER WITH WIND-RESISTING BODY

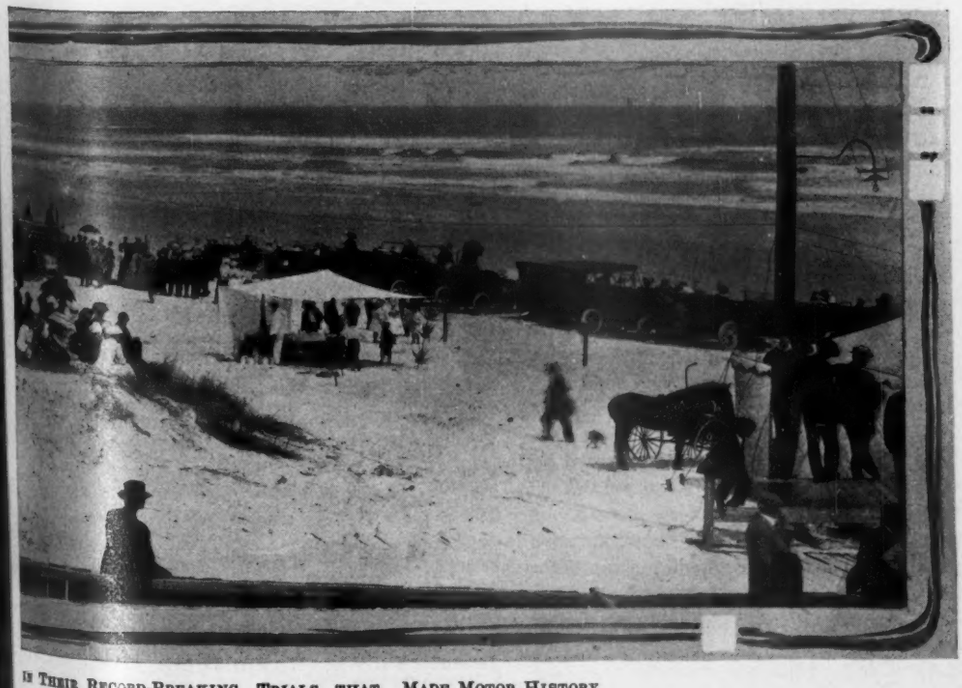
Frisco Wants Road Race in Park

SAN FRANCISCO, CAL., March 25—Unless the plans of the Automobile Club of California miscarry, San Francisco will be put on the motor map this year by a road race that, according to tentative arrangements, bids fair to rival big motor car contests of the country. The directors of the Automobile Club of California have applied to the board of supervisors for permission to use exclusively on Saturday, September 10, certain boulevards in the city and roads in Golden Gate park in order to hold a 50-mile road-race. The supervisors have turned over the application to the street committee and the intimation is that this committee will refer it back to the main body with a favorable recommendation, for at the time the contest is scheduled the Native Sons of the Golden West, an organization of native Californians, will be celebrating the sixtieth anniversary of the state into the union, and the city will be thronged with visitors; and the committee looks upon the contemplated race as an excellent attraction for the city's guests. It is the plan of the club officials to interest the largest motor car factories that maintain racing teams to enter in the contest, and as soon as the necessary permission for use of the desired roads is secured a campaign will be inaugurated to have these manufacturers sign the entry blanks. The exact course of the race has not been decided upon, but it is generally understood that it will embrace the Nineteeenth avenue, Sloat and Ocean boulevards and certain drives in Golden Gate park leading from Nineteenth avenue to the Ocean boulevard. These roads are in excellent condition. The Ocean boulevard is a straight and level shoot of about 4 miles, and the Sloat boulevard which joins it is an equally straight and wide 2-mile stretch. A right-angle turn will be encountered at the junction of the Sloat and Nineteenth avenue boulevards, and the latter highway is a straight and steady upgrade for a mile and a quarter, when a straight down shoot runs into Golden Gate park, where the drives are of a rolling and winding nature, but will afford excellent traction for the speeding cars.

FINISHED HIS BATTLE WITH OLD FATHER TIME AT DAYTONA, FLORIDA

OLD RECORDS

Year	Time	M.P.H.	Holder	Year
1910	:18 2-5	122.3	Marriott, Stanley	1906
1910	:30 3-5	117.64	Chevrolet, Darracq	1906
....	:28 1-5	127.66	Marriott, Stanley	1906
1910	No previous beach record.			
1910	No previous beach record.			
....	:33	109.9	Bruce-Brown, Benz	1909
1910	:58 2-5	123.28	Demogeot, Darracq	1906
....	2:34	116.8	Hemery, Darracq	1906
....	5:14 2-5	113.2	Bruce-Brown, Benz	1909
....	38:51	77.25	Fletcher, de Dietrich	1905
....	1:12:56	82.26	Bernin, Renault	1908
....	3:16:48 2-5	76.27	Cedrino, Fiat Cyclone	1908



IN THEIR RECORD-BREAKING TRIALS THAT MADE MOTOR HISTORY

National Championships the Latest

NEW YORK, March 30—Special telegram—A national championship race meet, held under the direction of the contest board of the American Automobile Association, is the latest development in motor track racing for the season of 1910. Announcement was made of this meeting by the contest board, which held a meeting in New York yesterday. It was decided to hold the races on the Indianapolis motor speedway May 30, following a grand circuit race meet to be held on that track May 27 and 28.

The national championship races will be composed of about fifteen events for all classes of stock cars. Each class will compete for the championship at both 5 and 10-mile distances. The prizes will consist of gold championship medals for each winner, silver medals for each second and bronze medals for each third for all of the class stock care, as prescribed in the 1910 rules.

Entries must be made to the contest board of the A. A. A., which has absolute control over the championship races. These are the first national championship races held under the new 1910 rules and classifications of A. A. A., and it is likely each division in the championship races will be filled with entries at an early date. Every manufacturer is naturally anxious to win a championship medal. It would carry with it more weight than all of the minor race trophies. The contest board has been arranging this event for several months, but not a word has ever been said about it until this time.

At the meeting of the contest board in the national headquarters, 437 Fifth avenue, New York, the final arrangements were concluded and the speedway owners were notified that they could make an official announcement of the national championship races in connection with their grand circuit meet.

The completion of the arrangements for the championship races was the most important thing done by the contest board this week. The members of the board who attended were: S. B. Stevens, of Rome, N. Y.; T. A. Wright, Wilkes-Barre, Pa.; Alfred Reeves, New York; and S. M. Butler, chairman, New York. Lewis R. Speare, president of the association, was present and approved of the action of the contest board.

Rules and entry blanks for the 1910 Glidden tour, which starts from Cincinnati June 15, were ordered printed and distributed to the manufacturers and other possible entrants. The board also authorized the positive announcement that the tour will start from Cincinnati, notwithstanding numerous official reports to the effect that other cities are under consideration as starting points.

The board directed that printed instructions be sent to the board's technical representatives throughout the United States and its referees and associate members. There are twenty-four associate members of the contest board now scattered throughout the country, together with a large corps of technical representatives and able advisory committee completing a working organization which is national in character and strength.

The board ordered certificates of racing records issued to Barney Oldfield for recent performances on the Florida beach. All of the rules of the association have been complied with, and Oldfield's official record is announced as follows: 1 mile flying start, :27.33; 1 mile, standing start, :40.53; 1 kilometer, flying start, :17.04; 2 miles, flying start, :55.87.

An appeal which was taken from a decision of the referee in a race in connection with a road race from Los Angeles, Cal., to Phoenix, Ariz., was passed on by the board, which decided that the letter and spirit of rules of race had been violated. The race in question took place on a track following the road race. The cars were supposed to participate in the race in the same condition in which they finished the run. The protested Pennsylvania car changed its wheels before starting in the track race and won, whereupon the entrants of a Columbia car protested to the referee, who decided in favor of the Pennsylvania car, on the grounds that the rules merely prohibited the changing of gears. An appeal was taken by the Columbia from the decision of the referee. The contest board sustained the appeal and directed that the purse of $500 be awarded the Columbia car.

The board announced that it had registered to date more than 100 contest drivers in both the amateur and professional classes. Thirty registrations were received in one mail from Atlanta, Ga., where a hill-climb was recently held. Every driver for a sanctioned contest during the present season must be first registered at the national headquarters. Application for registry blanks can be made direct to the contest board in New York or its associate members in the principal cities throughout the country.

Butler Revises Contest Schedule

New York, March 28—A revision of the 1910 calendar by Chairman S. M. Butler, of the contest board of the American Automobile Association has been made, showing changes made since the first announcement in February. Since that time track meets have been announced by Cheyenne, Columbus and Waco, while Atlanta has chosen October instead of November for its fall list. Several more reliability runs are booked, among them being Harrisburg, Pa.; Richmond, Va.; New Brunswick, Mass.; Columbus, Ga.; Dallas, Tex.; Oklahoma City, Okla., and Long Island. Chairman Butler is planning to leave for the Pacific coast this week to attend the opening meet of the new Los Angeles track. The official schedule is as follows:

TRACK MEETS

Atlanta, Ga.—Atlanta Automobile Association, May 5, 6, 7
Indianapolis, Ind.—Motor Speedway, May 27, 28, 30
Kansas City, Mo.—Automobile Club of Kansas City, May 28-30
Boston, Mass.—Bay State Automobile Association, May 30
Brighton Beach, N. Y.—Motor Racing Association, May 13, 14
Philadelphia, Pa.—Quaker City Motor Club, June 4
Indianapolis, Ind.—Motor Speedway, July 1, 2, 4
Dallas, Tex.—Dallas Automobile Club, July 4
Cheyenne, Wyo.—Cheyenne Motor Club, July 4
St. Paul, Minn.—Minnesota State Automobile Association, July 4
Wildwood, N. J.—Motor Club of Wildwood, N. J., July 4
Wildwood, N. J.—North Wildwood Auto Club, July 30
Galveston, Tex.—Galveston Cotton Carnival, July-August
Philadelphia, Pa.—Quaker City Motor Club, August 6
Indianapolis, Ind.—Motor Speedway, August 12, 13
Cheyenne, Wyo.—Cheyenne Motor Club, August 17
Columbus, O.—Columbus Auto Club, August
Cheyenne, Wyo.—Cheyenne Motor Club, September 5
Indianapolis, Ind.—Motor Speedway, September 2, 3, 5
Wildwood, N. J.—September 5
Minneapolis, Minn.—State Fair, September 5-10
Providence, R. I.—Rhode Island Auto Club, September 9, 10
Syracuse, N. Y.—Automobile Dealers' Association, September 18
Indianapolis, Ind.—Motor Speedway, October 7, 8
Dallas, Tex.—Dallas Automobile Club, October 27, 28, 29
Atlanta, Ga.—Atlanta Automobile Association, October 20, 21, 22
New Orleans, La.—New Orleans Automobile Club, November 5, 6
San Antonio, Tex.—San Antonio Auto Club, November 6, 9, 13
Waco, Tex.—Waco Auto Club, November

TRACK MEETS, PACIFIC COAST

Santa Rosa, Cal.—Santa Rosa Auto Association, May 15.
Los Angeles, Cal.—Motordrome, May 29, 30, 31
Los Angeles, Cal.—Motordrome, July 2, 3, 4
Los Angeles, Cal.—Motordrome, September 5
Seattle, Wash.—M. R. Guggenheim, September 10, 11, 12
Spokane, Wash.—Interstate Fair
Santa Anna, Cal.—Orange County Carnival, October 6, 7, 8

ROAD RACES

Denver—Denver Motor Club, May 30
Riverhead, L. I.—Motor Contest Association, June 1
Grand Rapids, Mich.—Grand Rapids Automobile Club, middle July
Denver, Colo.—Denver Motor Club, September 5
Vanderbilt—Motor Cups Holdings Co., October 1
Fairmount Park—Quaker City Motor Club, October 8
Savannah—Savannah Automobile Club, November 24

ROAD RACES, PACIFIC COAST

Santa Rosa—May 9
Portland—Portland Auto Club, June 11
Santa Monica—Licensed Dealers, Los Angeles, July 1 to 10
Mount Baldy—September 10
San Francisco-Portola—October 23
Los Angeles-Phoenix—November 24

HILL-CLIMBS

Bridgeport, Mass.—Auto Club of Bridgeport, May 30
Wilkes-Barre, Pa.—Wilkes-Barre Automobile Club, June 11
Worcester, Mass.—Worcester Auto Club, June 4
Cleveland, O.—Cleveland Auto Club, June
Ossining, N. Y.—Upper Westchester A. C., June 18
Auburn, N. Y.—Automobile Club of Auburn, July 4
Plainfield, N. J.—Plainfield Auto Club, July 11
Richfield Springs, N. Y.—Automobile Club, middle July
Algonquin, Ill.—Chicago Motor Club, August 15
Denver—Denver Motor Club, November
Minneapolis—Minneapolis Automobile Club
St. Paul—Automobile Club of St. Paul
Redlands, Cal.—Mile-High Hill-Climb Association, November 24

RELIABILITY RUNS

Flag-to-Flag—G. A. Wahlgreen, May 2
Harrisburg—Motor Club of Harrisburg, May 9, 10, 11
Norristown—Norristown Auto Club, May 18, 19
Hartford—Auto Club of Hartford, May 19, 20, 21
Fort Worth—Fort Worth Star-Telegram, May 22
Detroit—Auto Dealers' Association, May 25
Richmond, Va.—Times-Despatch, June
Glidden tour—A. A. A., June 15 to 30
Denver—Denver Motor Club, June
New Brunswick—Middlesex Auto Club, June
Washington—Washington Post, June (May 27-31)
Columbia, Ga.—Auto Club of Columbia, June
Dallas, Tex.—Implement and Vehicle Journal, June
New York-Seattle—M. R. Guggenheim, July
Philadelphia—N. Wildwood A. C., July 2
Minneapolis—Minneapolis Auto Club, August 1
Munsey tour—Frank A. Munsey Co., August 15
Minneapolis—Minnesota State Automobile Association, August 31
Philadelphia—No. Wildwood Auto Club, September 3
Cleveland—Cleveland Auto Club, September
Kansas City—A. C. of Kansas City, September
Louisville—Louisville Auto Club, October 3
Chicago—Chicago Motor Club, October 15, 16, 17, 18
Denver—Denver Motor Club, October
Worcester, Mass.—Worcester Auto Club, October
Oklahoma City—Oklahoma Auto Association, October
Long Island—Long Island Automobile Club

TOLEDO'S OPENING WEEK CARD

Toledo, O., March 26—The week of March 28-April 2 will witness the greatest activity in the motor business ever seen in this section. Because of the inability to secure a building which would meet the requirements of the greatly increased business of Toledo the plan of an opening week with individual exhibits at the salesrooms and garages of the various concerns was decided upon. The bulk of the motor business of Toledo has been gradually centering on Madison avenue for some time, and while there are some large concerns in other locations that street will be the center of the week's activity. The big show will be formally ushered in on Monday night when the button will be pressed that will flood Madison avenue with artificial daylight the entire length of the row, from Huron street to Thirteenth and from that time on there will be things doing all week.

PROTEST FREIGHT RATE INCREASE

Boston, Mass., March 26—The Boston Automobile Dealers' Association held a meeting here today at which the question of increased freight rates was discussed. The association had received word that the matter was to be discussed at the meeting in New York on Tuesday and so the association went on record against any increase in the rates. It was voted to send the protest to the motor officials who will speak for the industry, and the organization will also call upon the local freight officials of the railroads and explain their views. President J. H. MacAlman, of the Boston association, in speaking of the matter said: "At the present rate, for a single car we are asked to pay on a minimum weight of 2,500 pounds double the first-class rate. If cars are shipped in carload lots with a minimum of 10,000 pounds, we pay the first-class rate, and it is often better for us to ship in carload lots than to pay the rates demanded for single cars. The advance of 25 per cent is too much."

Hess-Bright Patent Held Valid

PHILADELPHIA, PA., March 28—A decision has been handed down recently by the circuit court of the United States for the eastern district of Pennsylvania in favor of the Hess-Bright Mfg. Co., for infringement of certain claims on ball bearings by the Standard Roller Bearing Co. The case was in connection with patent No. 822,723, granted June 5, 1906, and No. 838,303 granted December 11, 1906, to Robert Conrad, which were transferred by him to the Deutsche-Waffen-und-Munitions-Fabriken, the Hess-Bright Mfg. Co. being the licensee in America. The suit was for infringement of claims 2, 8 and 9 of the first patent and No. 1 one of the second patent. The three claims in the first patent refer to two concentric rings having opposing grooves, the sides of these grooves being to prevent lateral movement of the balls and the sides of these grooves being uninterrupted throughout their circumference.

The second patent, No. 832,303, was issued 6 months after the article was patented and refers to the assembling of ball bearings, in which the rings are placed eccentrically until the requisite number of balls is inserted, when the rings are placed concentrically and the balls distributed.

"The Lechner patent referred to and set up by the defendant, the Standard Roller Bearing Co., as an illustration of the prior art, is an illustration of the attempt to produce a bearing with a continuous and uninterrupted raceway," declares the court. "The filling opening of this patent extends entirely to the bottom of the raceway and the sides are interrupted by the filling opening cut therein. It does not satisfy the demand in the art for a continuous and uninterrupted raceway; and the Pettee patent, which is for a roller bearing, shows plainly upon its face that the inventor did not have in mind the principle embodied in the Conrad patent. The inventor undoubtedly was striving to construct a device for a roller bearing with a continuous and uninterrupted raceway for the rollers, but he failed in that the outer casing is divided into two parts in order that the bearing may be assembled, and this produces the interrupted raceway.

"It is true that the defendant constructed a model of the Pettee device which can be assembled by eccentric displacement, but it was acknowledged on the part of the defendant's expert that it was not constructed in exact accord with the dimensions set forth in the patent, but had been adapted to be assembled in accordance with the method found in the Conrad patent. In other words, it was now ascertained that the Pettee device can be constructed and assembled in accordance with the methods of manufacturing and assembling the defendant's roller bearings, but only by the use of the information suggested by the Conrad patents."

The court concludes by saying, "It is very evident that the manufacturing and assembling of this ball-bearing device by eccentric displacement is entirely new, as no other ball bearing ever has been made which could be entirely assembled in this way, resulting in making practical a continuous and uninterrupted raceway. It is ordered that a decree be entered for complainant, the Hess-Bright. Mfg. Co., with costs to be taxed by the clerk."

PETREL PLANT IS SOLD

Milwaukee, Wis., March 28—The entire assets of the Petrel Motor Car Co., 480 Virginia street, Milwaukee, Wis., have been purchased by the Filer & Stowell Co., Becher and Ziemer streets, Milwaukee, from the receiver at the price of $24,100. The Filer & Stowell Co. is one of the largest manufacturers of sawmill and other machinery in the United States and owns and operates the Beaver Mfg. Co., 145 Burrelle street, Milwaukee, an extensive producer of engines for motor cars of all kinds. By the purchase of the Petrel plant and assets, the Filer & Stowell Co. becomes a factor in the motor car field. Walter J. Read is president and general manager and Thomas J. Neacy is secretary and treasurer. Thomas O'Neil, general superintendent of the company, and in charge of the various plants owned and operated by it makes the following statement to Motor Age: "We already have started to continue operations of the Petrel Motor Car Co. and intend to push development work for all it is worth. The plant was taken over on March 24 and within the present week will be running full blast. The plant will be under new management and expansion has already been started."

LEAR RECEIVER DISCHARGED

Columbus, O., March 28—Columbus stockholders in the Oscar Lear Automobile Co., of Springfield, O., have been informed that the receivership was dissolved and the new company to be known as the Kelly Motor Truck Co. will have entire control of the plant. According to the report made to the court, the receivership has been very successful and the liabilities were reduced materially under Receiver Charles L. Bauer. E. S. Kelly, president of the Commercial Club of Springfield, will be at the head of the reorganized company. The building of additions to the plant will be continued.

COIL COMPANY ELECTION

Dalton, Mass., March 26—The annual meeting of the stockholders of the Pittsfield Spark Coil Co. was held recently, and the following officers were elected: Michael Casey, president; William P. Wood, treasurer and manager; William T. Petherbridge, clerk; Michael Casey, William P. Wood, Zenas Crane, Thomas J. Wetzel, Charles A. Byram, directors.

The Readers' Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

TWO HISTORIC MACHINES

BRENHAM, Tex.—Editor Motor Age—I am sending herewith two pictures of machines, one is an old fellow that was made years ago, and said to be the first motor car made and run in the United States. The better-looking vehicle is the one with the improvements or, at that time supposed to be an up-to-date car, but now is a back number. This car was the first ever run in the streets of Brooklyn, and caused such a commotion that the authorities had the try-out made before daylight. Of course now they are old-timers and are not in running order. Both are electrics and now in my possession at this place.—C. G. Botts.

SALESMEN'S SHORTCOMINGS

Racine, Wis.—Editor Motor Age—In wandering through any show one cannot help being amused at some of the claims and remarks made by various exhibitors. No one expects all the attendants to be experts, but it does seem strange that those who are not acquainted with the good and bad features of the car should be allowed to talk so freely without a little previous coaching as to what should be kept in the dark. The writer was somewhat surprised at one party who called the attention of the crowd to the fact that by lifting the front floor board one found himself directly over the gearbox. When the floor board was raised, sure enough there was the gearbox, but the only means for getting a look at the inside was through a small hole which was none too large for the admission of lubricant and certainly too small for the entrance of even a small hand. To get at the gears the lower half of the case had to be removed.

In another case two pieces of steel had been electrically welded and later twisted a number of times, apparently to demonstrate the strength of the weld, the burr from which had not been removed. The attendant explained that the exhibit demonstrated the strength of the steel. When asked about the burr he explained that the twisting had caused it at the weld, which, of course, could not be expected to stand such treatment.

At another booth, where the cars had no adjustment between the cone clutch and its pedal, one was informed that adjustment was easily accomplished by simply pulling the cork inserts further out of their holes or by changing the adjustment of the small pins which lifted the leather facing at several points, referring to the pins and springs provided to give easy clutch engagement.

Another well-meaning fellow called attention to the fact that the car he represented had no torsion tube and that the torque was taken by the two radius rods which were flexible and did away with the vibration to a great extent. As a matter of fact, the torque was taken by the springs, since the radius rods were hinged at both ends and hence could resist no bending action. The small differentials provided on the brake cross shafts of one car instead of equalizers of the ordinary style, were continually referred to as universal joints when the demonstrator called attention to them. The questions asked by some of the onlookers are as interesting as the answers received, one fellow becoming unusually interested upon first seeing the single-cylinder engine of the Brush car, because he first thought it was an engine without cylinders.—M. R. Wells.

PRESERVING BRASS POLISH

Findlay, Ill.—Editor Motor Age—Does Motor Age know of any way to keep brass parts of a car from tarnishing while in storage?—Subscriber.

Two methods are generally recommended to prevent the tarnishing of brass parts while in storage. One way is to apply a heavy coat of brass polish and leave it on; the other is to smear vaseline upon them.

RUHL'S VALVE TROUBLE

Racine, Wis.—Editor Motor Age—In Motor Age, issue March 17, there appeared an inquiry from Dr. A. M. Ruhl, Edmond, Okla. Judging from the symptoms which the doctor mentions, I am inclined to think his troubles may have been caused by something not mentioned in your answer. If he has not already overcome the trouble, I suggest that he carefully examine the valve stems and their guides for any signs of sticking. If the tension on the valve springs is none too great and the sticking or friction is not too severe, the result may be some such erratic action as the doctor mentioned.—M. R. Wells.

NO NEW YORK-ATLANTA WINNER

Cleveland, O.—Editor Motor Age—Through the Readers' Clearing House will Motor Age state which car won the New York-Atlanta reliability run; also which car went 190 miles in 3 hours 10 minutes without stopping?—J. A. Wagner.

No winner was declared in the New York-Atlanta reliability run, as the majority of the cars had perfect scores. As to the latter portion of your question, you will have to be more explicit. If you refer to the speed made in the reliability, Motor Age would state that the rules did not permit the cars to exceed the legal speed limits of 20 miles per hour. If you have in mind some speed demonstration, be more explicit as to whether it was a road or track performance and when and where made, if possible.

CARBURETERS AND IGNITION

Cincinnati, O.—Editor Motor Age—Will Motor Age kindly answer the following questions: 1—What adjustments have the Peerless, Packard and Stoddard-Dayton on their carbureters, and how many?

2—Has the model 10 Buick a low or high-tension magneto, and is the coil on the dash for the batteries or magneto? Does the battery current run through the magneto, timer and windings, or just the timer?

3—Why cannot the Buick model 10 be started on the magneto, when such cars as the Hupmobile only have a magneto and start easily?

4—In selective and progressive transmissions, is it necessary to release the clutch every time in changing from one speed to another, and can one go from first to third without injury to the gears?

5—What is the best way of figuring horsepower on a stationary engine?

6—For stationary work what would be the best method of cooling in a four-cylinder Ford motor?—A Subscriber.

1—On the Peerless carburter an adjustment is furnished on the auxiliary air valve spring. On the Packard the spring tension of this valve may be adjusted by inserting a wedge device beneath the spring. The further the wedge is inserted the stronger is the spring tension. On the Stoddard-Dayton a double adjustment is furnished on the auxiliary air valve and on these cars an air valve is placed on the manifold which may be controlled from the steering column or dash.

2—Model 10 Buick has a low-tension magneto, and the coil on the dash is used to raise the voltage of the current taken from the magneto. The battery current passes through the coil on the dash and by way of the magneto distributor to the spark plugs.

3—There is no reason why the Buick cannot be started on the magneto.

4—It is necessary to disengage the clutch with either a selective or progressive gearset when changing from one speed to another, no matter what speeds are referred to.

5—Do you refer to a low-speed, low-compression gasoline engine, or a high-

speed, high-compression engine which is put to stationary work?

6—The best cooling method would be a large water tank located so the level of water in which is higher than the cylinder heads. A flow of water by thermo-syphon means will be maintained. The amount of water required can be determined only by practice.

COMPARES BUICK HORSEPOWER

Norris, Mont.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following:

1—Which of two motors will develop the greater power, one of two cylinders opposed, with 4½-inch bore and 5-inch stroke, or one of four cylinders with 3¾-inch bore and 3¾-inch stroke?

2—What is the weight of the Buick model 10 runabout?—Normont.

1—If both the motors referred to above are of the Buick make, the two-cylinder motor will give the greater horsepower. It is claimed that on the test block, at a piston speed of 750 feet per minute, the two-cylinder motor develops about 22 horsepower and the four-cylinder about 18 horsepower.

2—The model 10 Buick will weigh, with body and equipment, 1,550 pounds or thereabouts.

METZ CAR DETAILS

Eskridge, Kan.—Editor Motor Age—Will Motor Age through the Readers' Clearing House answer a few more questions for me? I have a friend who has been in correspondence with the Metz company. I never have seen any of its cars, and the company does not seem inclined to answer our questions.

1—Does the Metz car have a clutch, and if so, what kind?

2—Is the Metz car one that will stand every-day use, such as doctors and mail carriers would give it?

3—For a light car, is not friction transmission more practical than a two-speed gearset?

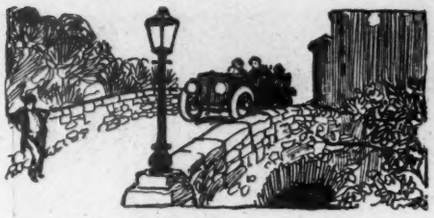
4—What kind of a differential has the Metz car? Where is it located?

5—Is it a wise idea to take up the agency for that car in a country where there is no competition?

6—At present, which is the stronger organization—the A. M. C. M. A. or the A. L. A. M.—that is, which represents the most capital?—J. McDowell.

1—The Metz car has no clutch. It is a friction-drive car of simple design. A friction disk on the end of the main driveshaft which is flexibly connected directly to the flywheel of the motor is brought to bear on a sliding fiber-covered ring on the jackshaft. The jackshaft is located under the seat, which is over the rear end of the chassis and at the required distance in front of the rear axle. Side chains are employed to transmit power from the jackshaft to the rear wheels.

2—Motor Age knows of no reason why the Metz car should not be satisfactory.



3—All depends upon the design of the transmission, its adaptability to the work which the car will be called upon to perform, and the disposition of the driver. A friction transmission properly designed gives most practical results, but owing to the fact that it is so easily handled and gives such a wide range of control, drivers generally are disposed to take advantage of this and submit the transmission mechanism to severe abuse. Nevertheless, its use on commercial vehicles is steadily increasing in popularity. The efficiency of the gearset, its absolute positive drive, and the confidence of the public in it, leads many light-car designers to employ it in their productions.

4—The differential of the Metz car is of the spur-gear type, and is located on the jackshaft just inside of the right side-member of the frame.

5—It all depends upon the territory, the agent, and the adaptability of the car to the wants of the people in said territory.

6—The A. M. C. M. A. is no longer in existence. At the annual meeting of the A. M. C. M. A. held during the recent Chicago motor car show the 5-year agreement existing between the independent makers expired and was not renewed nor has been to the present.

AN ADDRESS WANTED

Lanark, Ill.—Editor Motor Age—I have been instructed by a factory salesman of a motor car concern to use Floyd's lubricating oil in the engine of my touring car. Can anyone through the Readers' Clearing House inform me where I can obtain this oil?—John L. Morris, Jr.

MOTOR CYCLE BEACH RECORD

Memphis, Tenn.—Editor Motor Age—Will Motor Age please inform me through the Readers' Clearing House, what is the world's mile straightaway record for motor cycles. A claims that the mile has been covered in :24 or less. Will Motor Age please give us the record?—Everett D. Woods.

The world's mile straightaway record for motor cycles, as recognized as official by the Federation of American Motorcyclists, is :43⅘, made by Walter Goerke at Ormond beach in 1909.

BEST CAR RECORDS

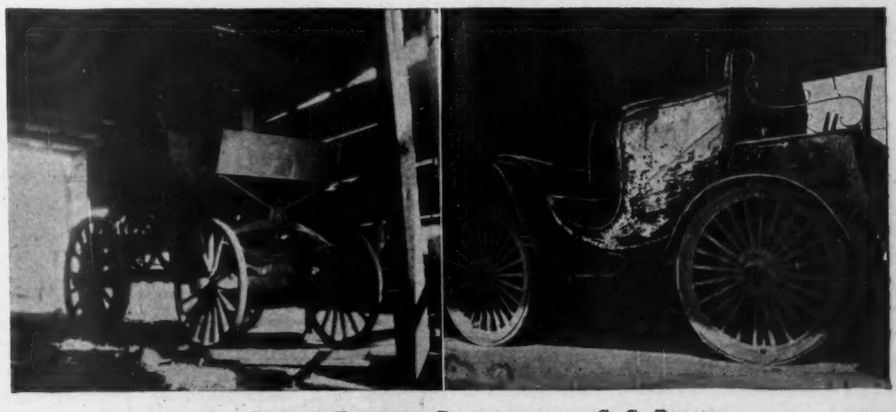
Jackson, Mich.—Editor Motor Age—Will Motor Age through the Readers' Clearing House kindly tell me which make of motor car has the best records?—Shmidt F. Milwalkee.

If you refer to speed, the Benz holds the straightaway mile record of 27.33 seconds or an average speed of 131.72 miles per hour. This was made at Daytona, Fla., on March 16. On March 23 this same car did a flying kilometer at the rate of 131.28 miles per hour. The 1-mile straightaway stock car record was made the same day by Oldfield in the Knox six in :40.35.

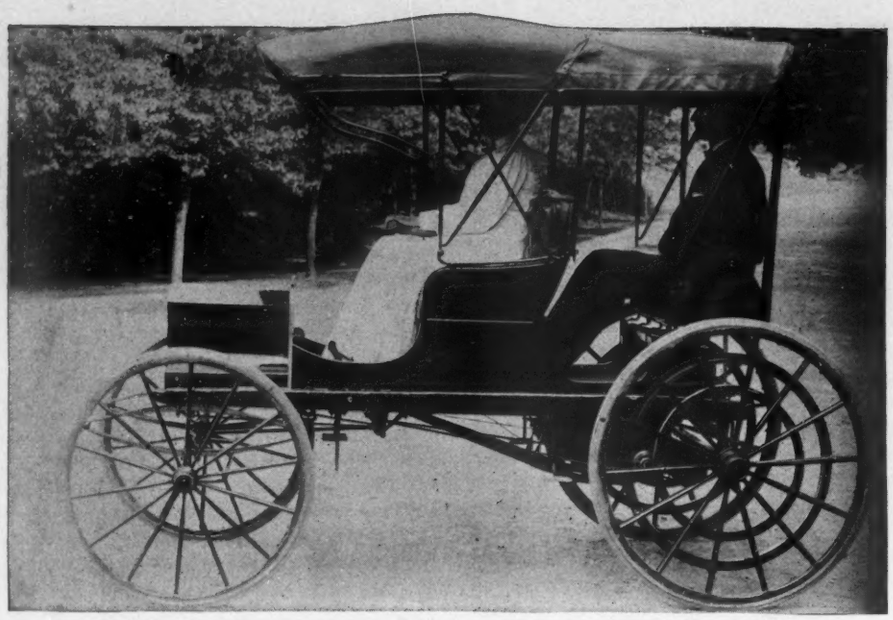
BREAKS MANY DIFFERENTIALS

Hebron, Mich.—Editor Motor Age—When there is a defect in the construction of a new car, does the 90-day guarantee hold good? The defect caused the breakage of a differential the same day the car was delivered to the buyer, and a new differential was installed in the course of 2 weeks, when the car was ready to run. It was driven less than 50 miles when the second differential broke the same way, then the car was laid up 6 weeks waiting for a new differential to be furnished. The roads were bad for a time, the car was used occasionally, and the axle inside the square broke in the differential. When the car was taken apart it was found that the cam running on ball bearings was not keyed to the shaft. The factory neglected to cut a key slot in the shaft, and the outside collar was put on the reverse side. This defect was an oversight, and when it was discovered the 90 days had elapsed. Should the factory make good the expense of the repair bill, or the purchaser stand it?—George H. Hayes.

According to the terms of the contract the factory would not have to stand the expense of the repair bill. However, if you can prove that the trouble was due to defective workmanship or material, the manufacturer, if a reputable one, undoubt-



Two Pioneer Electrics Referred to by C. G. Botts



DURYEA CAR FITTED WITH A TOP FOR RUMBLE SEAT

edly will be very glad to give you due credit. It often happens that a motorist neglects the lubrication or adjustment of an important part of a car, and considerable damage is done thereby; then, in an effort to learn the cause of the trouble he will take the mechanism apart and put it together again with some part lacking in the assembly or improperly fitted, with the result that when the car is again tried more damage is done. The owner then calls up the factory to repair the damage, for which it is not at all to blame. Experiences of this kind have led the factories to take all claims of this kind with a grain of salt, so to speak.

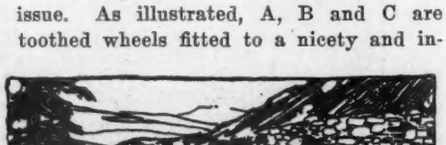
BRASS-ALUMINUM SOLDERING

Ashland, Ky.—Editor Motor Age—Will Motor Age kindly give me the process used in soldering brass and aluminum together? —C. W. Hutchison.

There are a number of aluminum soldering compounds on the market which have been recommended as giving good results, and Motor Age would be glad to hear from any of its readers in regard to their success with aluminum solders—and the process by which their success is obtained. Aluminum, on account of its low melting point, will not stand prolonged heating, as is the case with copper, which is perfectly amenable to the soldering process. Aluminum suddenly wilts under the heat application, hence it requires careful treatment or it will be placed beyond the pale of soldering. Fluxing and tinning is the process which renders soldering easy under ordinary conditions, and it is because aluminum will not be properly affected by this process that half the trouble is experienced. Even with solder of the proper character, it is difficult to accomplish the task of tinning in the absence of due preparation of the surfaces to be soldered. Since dampness is the bane of the process, assuming the surfaces are properly prepared, the safe method of proceeding will include the drying of all the surfaces, as well as the solder; this can be done in an oven at a temeprature almost high enough to melt the solder. When the parts are dry and held at the drying heat, the next thing to do is to scratch the surfaces so vigorously with a metal brush as to bring out the real untarnished virgin metal, thus removing all traces of oxide. The next process will include heating the metal above the melting point of the solder, and after applying the solder to the surfaces, actually brush it into intimate relation with the metal brush. If the solder refuses to adhere to the aluminum surfaces it is because the oxide still is present in sufficient quantity to defeat the aim. When the surfaces to be joined are well coated with solder it will be a simple process to join them under the heat high enough to melt the solder, and from that point on, all the rules of ordinary soldering work will apply. What is wanted for the purpose of heating is a Bunsen burner, although it is possible to do a fairly good-sized job with a good blow-torch; soldering irons are valueless for the work. And it is necessary to perform the operations with dispatch.

HYDRAULIC SPEED BOX DESIGN

Welden, Ill.—Editor Motor Age—I saw an illustration and description of a hydraulic clutch in the Readers' Clearing House columns of Motor Age, issue of February 24, and herewith submit a drawing of a combination hydraulic speed transmission and clutch which I think would surpass the one described in that issue. As illustrated, A, B and C are toothed wheels fitted to a nicety and inserted in the casings, and pipes D are used to circulate the fluid from the piston wheels, A, B and C. The shaft on wheel A is directly connected to the engine or motor shaft, and wheel C is connected to the sprocket wheel or driving shaft of the motor car or other load. When throttle E is wide open the motor may be running and the machine standing still, the oil or liquid is short-circuited through pipe F, but the instant the throttle is closed the fluid is forced around piston wheel C, to be used over again. My idea in using a piston wheel, B, is to keep the liquid from going on around wheel A, but force it around through the pipes. A reverse is employed by using cross pipes. A light grade of oil would be the best fluid for a lubricant. I also have an idea for a new system of gas engine cooling instead of water. I would suggest the finest quality of dry sand to circulate around the engine cylinder, and through a specially constructed radiator. It would not freeze, would be just as good as water, and a little better than air alone.—C. Holmquist.



GYMKHANA FEATURES

Mason City, Ia.—Editor Motor Age—Can Motor Age give us the list of gymkhana events that were pulled off on Michigan avenue, Chicago, in the fall of 1907, such as the teeter-board, obstacle race, and a number of others? We would like to put on the same things here to wake up the business a little.—Meredith Motor Car Co.

The first gymkhana held under the auspices of the Chicago Automobile Trade Association was on April 1, 1908, and comprised five events which were as follows: Average high-gear slow-speed race, apple race, sabering the enemy, teeter-board, and driving between obstacles. The rules governing a gymkhana admit of considerable latitude, however, and many unique features have been evolved since the origin of these interesting contests. The rules governing the events held in Chicago in 1908 were as follows:

Average High-Gear Slow-Speed Race—Contestants will drive on high-gear with foot off clutch pedal over designated course on west side of Michigan avenue between Twelfth and Thirteenth streets, best score being given contestant who averages closest to 4 miles per hour over course; a penalty of 1 point for each 5 seconds or fraction thereof for above or below this average. Stopping of car, stalling of engine or touching clutch pedal lever or zigzagging on course will disqualify for section. Cars started according to numbers at 3-minute intervals.

Apple Race—This section will consist of the driver taking one apple from each of four consecutive pails placed 20 feet apart on pedestals conveniently high and coming to four other pails similarly placed will drop one apple into each. This will take place between Thirteenth and Fourteenth streets on the west side of Michigan avenue. Drivers will be penalized 1 point for each failure of taking or depositing apples, and 5 points for each case of upsetting pails. This section must be driven on top or high-gear with foot or hand off clutch pedal or lever. Driving conditions as in section 1.

Sabring the Enemy—In this section the driver must strike four suspended lemons with a wand furnished him. These lemons will be suspended overhead at intervals of 10 feet. One point penalty for each lemon missed; 2 points penalty for each string hit; 5 points penalty for each supporting standard disturbed. Driving conditions same as in section 1.

Teeter Board—This event will consist in

balancing the car on a teeter board 20 feet long, 6 feet wide, resting on an 18-inch fulcrum. Car will drive onto teeter board until forward end touches ground; then reverse until rear end touches ground; then go forward to balance, balancing 30 seconds, then driving off ahead. One point penalty for each second under 30 in which contestant failed to balance. Each contestant has 2 minutes from time front wheels rest on teeter board to do this section in. In this section driver must use own judgment as to gears used and slipping of clutch as well as use of brakes.

Driving Between Obstacles—Each contestant will drive his car on high gear through straight lane bordered by four blocks on each side, blocks placed 4 feet apart and leaving a lane 4 inches wider than the tread of the car's tires. Penalty for displacement of each block, 1 point; for straddling blocks, 10 points.

MAGNETO COUPLING SLIPPED

Chicago—Editor Motor Age—Last week I had a little experience with my car which may be of interest to your readers. The motor is a six-cylinder one, had run with perfect regularity until one day it suddenly started heating. The water in the radiator would boil during ordinary street use. I examined the ignition system and found that the trouble existed in the Oldham coupling in the magneto shaft. There had been originally a little looseness in this coupling and the result was that the backlash had sheared off the pins by which the Oldham coupling fastened to the magneto shaft, thereby allowing the magneto to lag so that the spark was taking place too late and the heating was due to this late spark. It was but a short job of correcting the trouble and putting in new pins to hold the Oldham coupling in its proper place. It did not require long to locate the trouble because I discovered that when I switched from the magneto to the battery the car would pick up and travel faster on the battery, whereas when the magneto was in proper condition it would drive the car faster than the battery.—F. E. E.

FITTING ONE REO CARBURETER

Alameda, Sask.—Editor Motor Age—Through the Readers' Clearing House kindly advise me regarding my Reo motor car, model 1906, which misses in one cylinder. Originally it was fitted with two carbureters, but about a year ago I purchased the necessary piping and fitted the engine with one carbureter. Since the change was made the engine misses on one cylinder almost continually, with closed throttle and retarded spark. It is somewhat difficult to start, and always does so on one cylinder. By holding down one vibrator the other cylinder will run constantly without a miss and when the vibrator is released both cylinders will fire for a few seconds, after which one will cease to work. By holding down the other vibrator I get exactly the same results, that is, either cylinder will run without a miss when the opposite vibrator is held down. If a small quantity of gasoline is put on the sock of the carbureter the engine will start on the first turn, both cylinders working for a few seconds, after which one will cease to work. If the spark is advanced and throttle opened both cylinders will work. If the speed is less than 15 miles an hour there will be occasional misses. On turning corners or in other places where the spark is retarded and throttle closed to reduce speed, only one cylinder works. I had an expert spend a day on the car and he stated the ignition was working well and after going over all parts he stated the trouble was in the carbureter. After spending a day on the car he left it in exactly the condition it was when he started.—J. J. H.

Your best policy is to drill a $\frac{1}{16}$-inch hole in the bottom of the pipe leading to the front cylinder and a similar hole in the bottom of the pipe leading to the rear cylinder. These holes could be drilled midway between the ends of the branches. Where one carbureter is substituted for two on these motors it has been found most satisfactory to use $1\frac{1}{2}$-inch brass piping. The trouble with the carburation in your case seems to be the long distance from the carbureter to the intake valves. Condensation naturally occurs and the $\frac{1}{16}$-inch holes will permit the condensed gasoline to drain off.

CLAIMS IT'S HIS SCHEME

New York—Editor Motor Age—On page 24 of Motor Age, March 3 issue, appeared a communication from the Pierce-Arrow Motor Car Co. In this communication the horsepower formula $\frac{D^2SN}{12}$ is referred to as the Dendy-Marshall formula. As is stated in Motor Age, February 17 issue, I devised this formula in 1906. I first heard of Mr. Dendy-Marshall's name being connected with this rating in June, 1909. In answer to my letter of inquiry Mr. Dendy-Marshall wrote that he independently devised and published this formula in the Royal Automobile Club Journal in 1907. From this letter the question as to the originator of the formula would seem to be settled. Twelve months ago I advocated in Motor Age, the adoption of my formula in place of that of the A. L. A. M. In the leading article of Motor Age, issue March 3, it is stated that in the future motors may be designated simply by their cubic displacements, as a horsepower rating is rendered useless by any one of a score or more happenings, such as a drop of oil on a spark plug, a slight tension of a valve spring, etc. All this is quite true, but precisely the same objections can be raised against designating motors by their cubic displacements and therefore the latter method of classification is not one bit more accurate and is infinitely more complicated than a horsepower rating such as $\frac{D^2SN}{12}$.—John J. Ide.

EXPIRATION OF SELDEN PATENT

Lafayette, Ind.—Editor Motor Age—With reference to Selden patent granted in 1895 and expiring 1912:

1—What was the exact date of granting in 1895?

2—Will this patent absolutely expire in 1912 or is there a possibility of reissue or extension, and if so what will be the date of absolute expiration or expiration of the last extension, and what is the law on this point?—A. L. Sheridan.

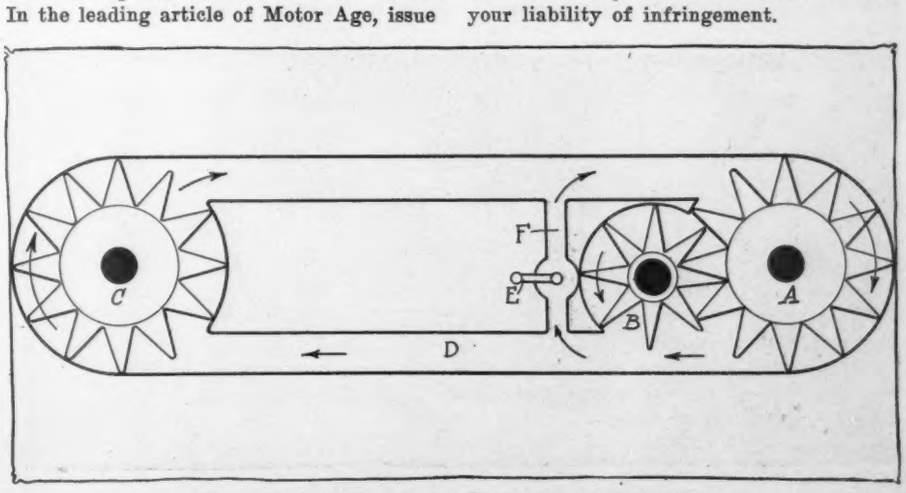
1—This patent was granted November 5, 1895, and the application was filed May 8, 1879.

2—There is no reason why this patent will not expire in 1912, because the legal life of a patent is seventeen years, and on November 5, 1912, it will have been in existence that length of time.

INFRINGES THE PATENT

San Antonio, Tex.—Editor Motor Age—I am building a car of my own make and design, making by hand all parts with the exception of the transmission, differential, steering gear, wheels and accessories. Will Motor Age inform me, through the Readers' Clearing House, if I will infringe on the Selden patent if I take this car out for my own use. What does the Selden patent comprise?—G. P. Mandry.

You are liable to prosecution by the Seldenites, if they so desire. The fact that the car is for your own use does not alter your liability of infringement.



HOLMQUIST'S DESIGN FOR A HYDRAULIC TRANSMISSION

PERTINENT POINTS ABOUT PATENT LAWS

EDITOR'S NOTE—This is part II of a series of three articles on the patent situation by Warren S. Johnson, president of the Johnson Service Co., Milwaukee, Wis.

IN a previous article I discussed the question of patents per se and intimated that the granting of a patent by the United States government indicated very little as to its validity. It must be taken for granted, therefore, that unless a patent has been adjudicated by the courts that its value is only prospective. If it has been passed upon by an expert in its particular line its validity may be approximately determined. I also stated that a possessor of a patent can use his discretion as to use of it. He can license others to use it, but is not under any obligations to license anyone he does not desire to. If he thinks it is being infringed he must institute suit against the infringer in a United States court.

It is a very simple thing to begin a suit and it costs very little money. He must make the usual allegations of infringement, etc., and the defendant must make answer, all of which is preliminary to the general work. It is only when a suit is instituted that any true determination can be made as to the validity of a patent, and only after a long process can a decision finally be reached.

Patent Courts Established

For judicial purposes the United States has over seventy districts and these districts are numbered. For instance, the New England states constitute the first district, and the court is held in Boston. The southern district of New York is the second district. Each district court is presided over by a judge and the suit must be instituted in his court, sitting as a court of equity. To those who are not conversant with processes of this kind the imagination leads them to believe that the case comes before a very dignified judge; that the witnesses appear before him and the matter proceeds as one is accustomed to see courts proceed, but there is nothing of the kind with reference to these patent cases. After the suit is once entered the judge knows nothing about it until it comes before him for a hearing, and it may not come before him for years. He sees no witnesses nor knows anything about their credibility so far as their manner in court is concerned, and judges only by the documentary testimony. The testimony is taken before a notary public or any court official who is empowered to administer oaths. It may be taken anywhere in the United States that is agreed upon by the opposing counsel. If the complainant desires to take testimony he notifies opposing counsel and can oblige counsel for defendant to appear at the point where the testimony is to be taken. The same is true of the defense. The practice is for each side to take testimony where it causes it the least expense, whatever the expense may be to the other party. An expert typewriter is procured and taking of the testimony proceeds by being written directly from the lips of the witness by the typewriter expert who is in attendance.

The opposing attorneys are supposed to be present, but it is not necessary for either one or the other to be there if they stipulate that the testimony may proceed without their presence. It certainly is a very elastic proceeding. This has been noted by Judge Hough in his decision on the Selden patent. The witness is asked questions and he proceeds to answer them. If the questions are long sometimes one or both attorneys leave the room. It may be hours before they come back if the answer is long, except as to note an adjournment. Sometimes, while one side is taking testimony, the attorney on the other side does not appear under stipulation that he may enter any objections if he chooses when he reads the testimony. If he is present and objects, the question is answered just the same. It is left to the judge to sustain the objection or not. If he sustains it, he simply ignores the answer when he reads the testimony. I have given testimony where the attorney on the opposite side had frequent calls to go out, giving me the impression that he was loading up. Of course, that course is not usually displeasing to the other side. I mention it only to indicate the freedom with which testimony is taken. Both sides employ experts and these experts give their ponderous testimony at great length. A good expert must understand the game. A man may know a great deal about the mechanical facts, but unless he has testified many times and understands something of the legal processes he does not know how to testify to the best advantage of his client. Of course, the experts give testimony of exactly opposite character, the same as do experts in other courts; as, for instance, if one expert of well-known reputation says a man is sane, another well-known expert of equal reputation says he is as loony as a bug. You can judge how much value the court eventually puts upon expert testimony.

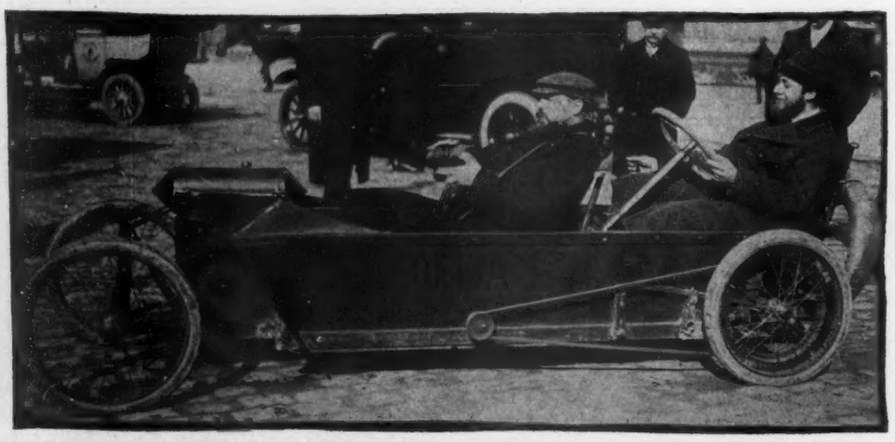
Details of the Suit

It is not necessary for me to go into minute detail as to how the suit is conducted, how exhibits are filed, etc. After the thing has proceeded perhaps for 6 months and perhaps for several years, all the testimony is printed. This printing includes not only the testimony but also any illustrations that may be necessary to use and any copies of patents exhibited. The testimony sometimes becomes extremely voluminous. It is a mistaken idea on the part of some litigants that the more counsel they employ and the more they pay them the more apt they are to succeed in the case. Fortunately, the result in a patent case either is, or should be, determined by cold facts, frankly and properly presented.

It is the province of the defense to introduce testimony to show that the patent is not valid, owing to the previous state of the art, or that the device as shown is inoperative, or that the claims do not show invention, etc. This testimony is printed so that the judge may read it. The attorneys file their briefs, the court meets, and for the first time the matter comes to the attention of the judge. Besides the attorneys and the litigants there seldom are others present. The attorneys argue the case and the whole matter goes to the judge for a decision. If, in the opinion of the judge, the defendant's devices do not infringe the patent, he does not pass upon the validity of the patent at all and allows some other court to pass upon that. If, in his opinion, it does infringe the patent, he must pass upon the validity of the patent.

Cases Last 2 Years or More

The time consumed from the institution of the suit to the final decision is seldom less than 2 years, and sometimes extends much longer than that. The defendant desires to prolong the suit if he thinks he is in danger of having the decision against him, and, strange to say, the complainant sometimes, too, prolongs the suit because he does not have much faith in his own patent and prefers to have a patent that is in court that he can club people with than one that is out of court with a decision against it.



BEDELIA, FRENCH HOME-MADE RUNABOUT WITH 3½-HORSEPOWER AIR-COOLED MOTOR

The opinion, having been rendered by the lower court, constituted of a single judge, is subject to an appeal by either party. When appealed, of course, there is no new testimony taken. The attorneys appear with briefs and arguments, and the defeated side's arguments are for the purpose of showing that the decision of the lower court was erroneous. Attorneys may bring in any kind of apparatus or any kind of drawings or whatever they please to illustrate the arguments and the points, but no new devices or documents can be brought in as exhibits in the case.

Circuit Court of Appeals

The circuit court of appeals is constituted of three judges instead of one and its decision is final. There are nine circuit courts in the United States. We hear about taking patent cases to the supreme court of the United States. Patent cases do not go to the supreme court of the United States except as an unusual proceeding, so do not let the reader imagine that any patent litigation is going to be continued up to the supreme court. The decision of the three judges of the circuit court of appeals settles it as to the particular case in that particular court, and if in favor of the complainant it holds against the particular defendant. Every tub stands on its own bottom, and it might be quite probable that a patent is declared valid and that a certain defendant infringes, but that is no sign that another defendant infringes. The court cannot presuppose that all defendants have the same devices and therefore that they equally infringe. A new case may come up in the same court as to infringement. The owner of the patent might get, and probably would get, a temporary injunction restraining the defendant in a new case, either manufacturer, seller or user, but the court would allow him to proceed by his giving a proper bond.

There is another point that seems to be very much misunderstood, and that is, the decision of the court applies only to the territory under its own jurisdiction. When the court in the second district renders a decision as to a certain patent, that has nothing to do with some other district in the United States and it is quite possible that a contrary opinion might be rendered by some other judge.

NO WHEEL TAX REVISION

Chicago, March 29—Just when the motorists' hopes were brightest for a revision of the local wheel tax the license committee before which it was pending changed its mind and decided not to recommend any changes in the prevailing rates, which are $12 for a two-passenger car, and $20 a year for three passengers or more. City Collector Magerstadt, working with the Chicago Motor Club officials, had favored a reduction which would bring the tax to $10 for two or three passengers, $15 for four or five and $20 for six or more.

Manufacturers' Communications

PROVING A THEORY

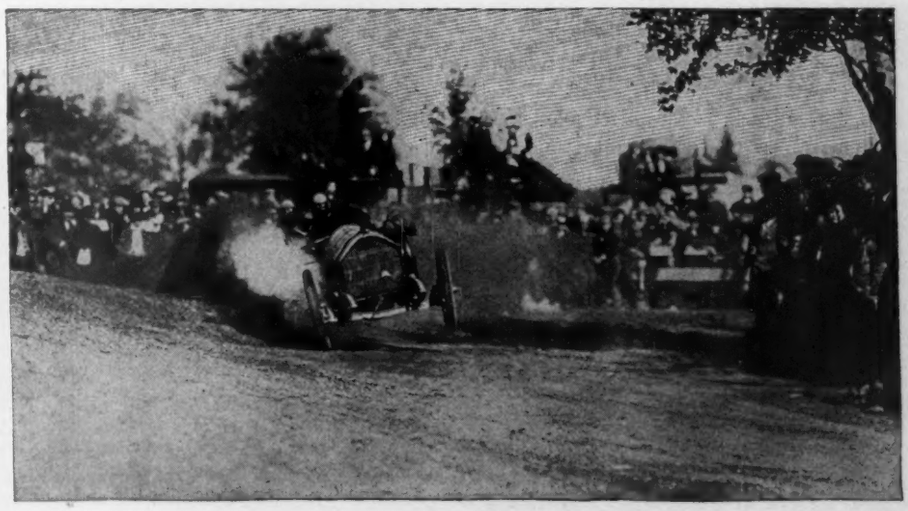
Detroit, Mich.—Editor Motor Age—That stock argument as to which wheels leave the ground when a car makes a turn at high speed, which has caused many editors much work in filling space to prove that the inside wheels rise up, is settled by the accompanying photograph. On many occasions cameras have caught wheels off the ground, but this snapshot of William Knipper in the last Vanderbilt cup race is unusually clear. The car is shown coming from the extreme right, making a left-hand turn. At the left is shown the high embankment on the turn. It is a simple fact of physics that under no circumstances could the outside wheels leave the ground. In running on a straightaway a car gains momentum in proportion to its speed. It also loses what is known as inertia; that is, were the power suddenly shut off, the car would continue to travel in the direction in which it was going until its momentum was overcome by inertia, when it would come to a standstill. In science inertia also is that quality which impels a moving object to continue its line of motion when the mechanical impetus is removed. In the case of a motor car rounding a turn the power is not shut off, but the force of inertia which tends to keep the car traveling in one direction is suddenly shattered. The impetus given by the motor compels the car to continue its momentum around the turn, but in overcoming the force of inertia the car tips. It is apparent in the above picture that the tendency of the speeding Chalmers was to follow its former direction from right to left in the photograph. When the car tipped it contineud to follow the earlier direction, and the inside wheels left the ground. The same rule holds in all circumstances. The car always follows its earlier motion in tipping, so that the inside wheels always are those which come off the ground. The photograph of Knipper in the Chalmers in the Vanderbilt cup race is well worth a careful study by those who are interested in this subject and who have been arguing the matter.—Chalmers Motor Car Co.

MAKE ODD-SIZED TIRES

Chicago—Editor Motor Age—In Motor Age, issue March 17, page 17, we notice an inquiry from a Vicksburg, Miss., reader, relative to equipping his car with 32 by 4-inch tires on which he is now using a 32 by 3½. It may perhaps be of interest to your correspondent to learn that we, in common with several of the other manufacturers, make what is known as mongrel sizes to fit the regular size rims. For instance, the gentleman in question can purchase a 33 by 4-inch tire which will fit his 3½-inch rims, the oversize being entirely above the rim of the wheel. By putting on this size he would increase his carrying capacity by at least 30 per cent, and at the same time should receive considerable more mileage than the difference in the price of the two sizes would indicate.—J. J. Alexander, Morgan & Wright.

COULD USE OLD RIM

Akron, O.—Editor Motor Age—In an inquiry in Motor Age, issue March 17, page 17, headed "Will Need New Rims," a car user asks if it is possible to put 32 by 4-inch tires on 32 by 3½-inch Michelin rims. The information given in one way is correct, namely that he cannot do this; but, at the same time, it would have been a good idea to have told him that tire makers can supply a 33 by 4-inch tire which will fit his present rim and then avoid the necessity of changing to the 32-inch size, at additional cost.—A. J. Willis, B. F. Goodrich Co.



WHICH WHEELS LEAVE GROUND?—KNIPPER IN THE VANDERBILT

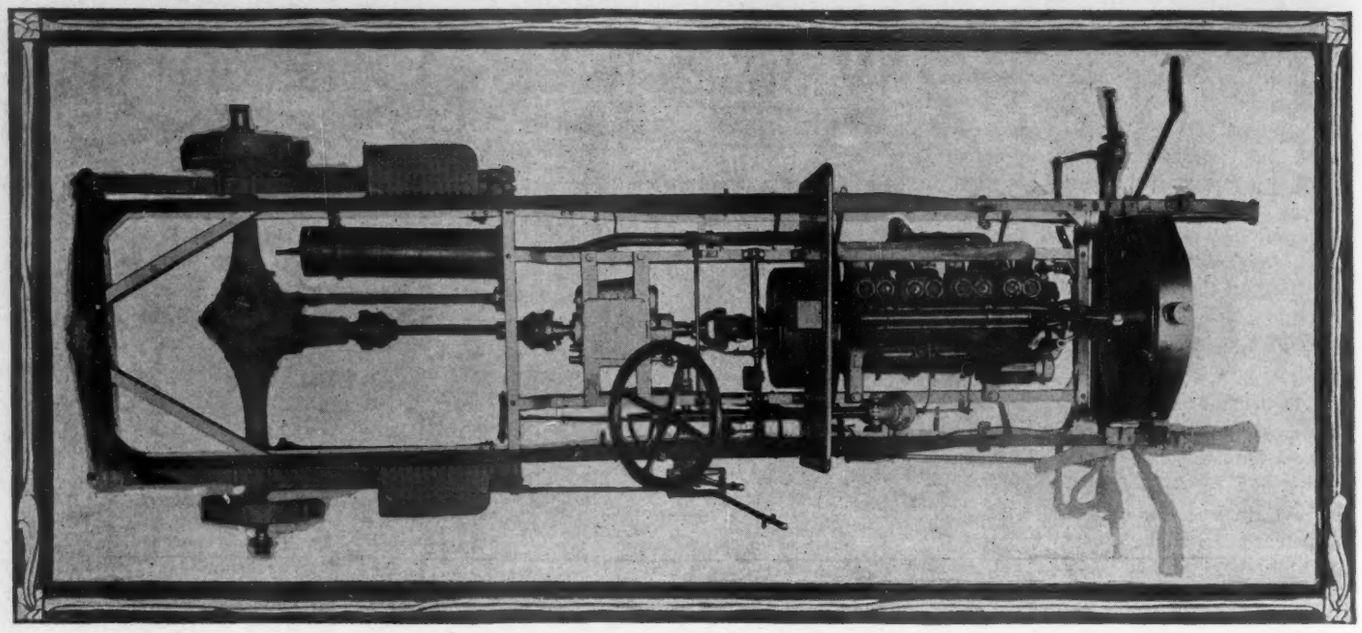


FIG. 1—LOOKING DOWN ON THE CHASSIS OF THE 1910 GROUT CAR

Only One Grout Chassis for 1910

FOR this year the Grout Automobile Co., Orange, Mass., offers one chassis to which any of the conventional bodies types are fitted, the buyer having the privilege of selecting his design. The Grout chassis, Fig. 1, comprises a four-cylinder Rutenber motor, a three-speed selective gearset, and a floating rear axle of the latest Timken construction, in which the housing is a pressed steel stamping. The chassis is made with 123-inch wheelbase for three models—runabout, touring car and toy tonneau—and all models are regularly fitted with 36 by 4-inch tires; in fact, there is no change in the chassis used on all three models.

The Grout running gear is built around a pressed steel frame construction, the side members of which are slightly offset at the dash, bottle-neck fashion, but they are in the same horizontal plane from front to rear, there being no drop in front of the rear axle. These frame members have a maximum vertical depth of 5 inches, are made from 5-32 stock, and a feature of construction is that the lower channel lip is ½ inch wider than the upper lip. As Fig. 1 shows, a subframe construction has been adopted, this consisting of a pair of longitudinal members supported front and rear on cross members of the main frame. On these subframe members the motor and gearbox are carried. The framework takes support through semi-elliptic springs in front and a platform support in the rear. The semi-elliptics measure 39 inches in length and are 2 inches wide. In the rear the platform spring has side members 42 inches long and a cross spring at the rear, 39 inches in length. The leaves employed in all rear springs measure 2 inches in width.

Details of Axle Construction

In a consideration of the axles on which the springs are seated, it will suffice to state in passing that the front axle is a nickel steel forging, carrying integral spring seatings and ending in Elliott type of jaws for taking the vertical hubs of the steering spindles. In the steering gear the tie-rod is placed in the rear of the axle. The front wheels are carried on Timken roller bearings. The rear axle is a floating Timken construction with a pressed steel housing, the general construction of which appears in Figs. 1 and 5, and which construction already has been illustrated in these pages. The two driveshafts are furnished at their outer ends with jaw clutches for engaging the wheel hubs, a construction which allows of withdrawing either of these shafts without removing the wheels. The differential gear with the driving pinion constitutes a unit, which is bolted to the pressed steel housing, so that by taking out a number of bolts the complete differential can be withdrawn. For inspection purposes there is a large rear plate which is readily removable. The differential gear itself may be removed through the rear opening in the housing, in which operation the driving pinion would be left intact, or, as already stated, should it be desirable to remove the driving pinion as well with the differential, both can be demounted through the front of the axle housing.

The Rutenber motor has a formula rating of 36.1 horsepower, the cylinders having a bore of 4¾ inches and a 5-inch stroke. This motor, illustrated in Figs. 3 and 4, Fig. 3 showing the magneto side, and Fig. 4 the valve side, is an example of the separate-cylinder type, each cylinder being an L design with intake and exhaust valves side by side. In the design of the crankcase recognition of the importance of oiling has been taken into consideration, and

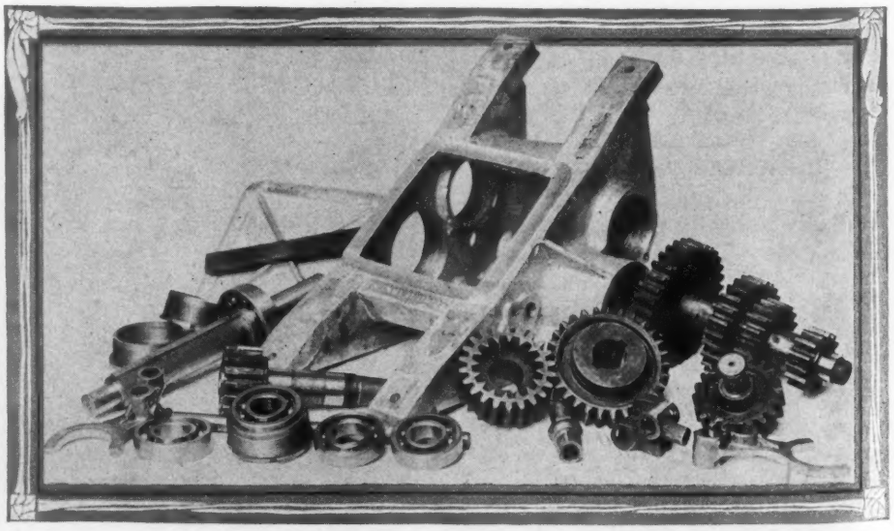


FIG. 2—THE COMPACT GROUT GEARSET DIS-ASSEMBLED

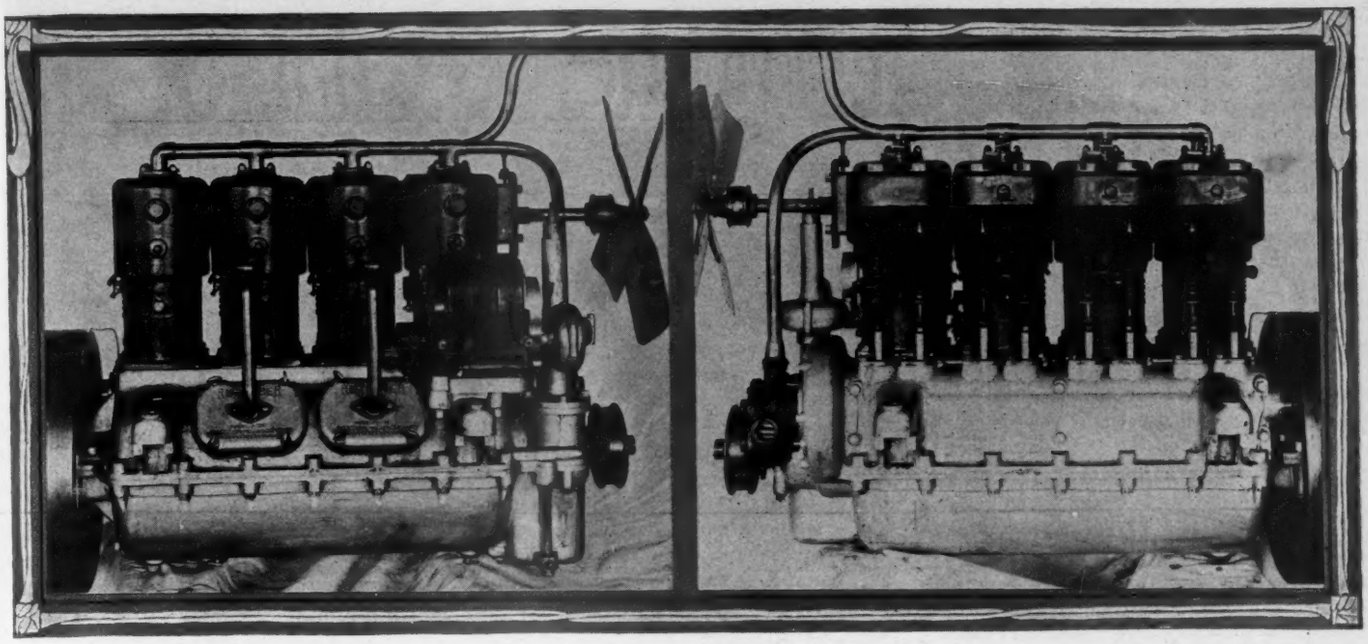


FIG. 3—RIGHT SIDE OF MOTOR USED IN GROUT CARS

FIG. 4—LEFT SIDE, WITH INLET AND EXHAUST PIPES REMOVED

But Several Types of Body Styles

the lower half of the case has been made to serve more than merely a receptacle into which the connecting rods dip, creating a splash lubrication; rather, in this lower half, there is a separate oil reservoir beneath the crankcase proper, and, as shown in Fig. 3, there is a small gear oil pump incorporated in the front end of this housing, which the oil pump taking the oil from the reservoir pumps it through channels to the four cylinders. From these four cylinders the oil forms a splash in the crankcase, and when it passes a certain level it overflows back to the reservoir.

From a constructive point of view this motor has been carefully worked out. The intake and exhaust valves are all made 2¼ inches in diameter, the large valves being a construction which is more and more coming to the fore. These valves are made with nickel steel stems and bevel seats. The camshaft, which operates both sets of valves, has the eight cams formed integrally with it, the shaft being finished by grinding. In the crankshaft special rigidity has been obtained in that it is carried on five plain bearings, instead of three, as is practiced in motors with the cylinders cast in pairs. The cylinders are made from a special gray iron alloy and before they are given the final grinding each casting is annealed to remove internal stresses set up in the metal during the casting process.

The pistons are especially long and made from a grade of hard iron. Each carries four eccentric rings with lap joints. The wristpins are hollow and I-beam connecting rods are steel forgings, bushed with Parsons white metal at the crankshaft end and bronze at the piston end.

At the front end of this motor a compact grouping of all the motor accessories, other than the carbureter, has been accomplished. The motor is designed with a vertical shaft driven from the crankshaft and on the lower end of which is the oil pump. To the upper end, if desired, the timer can be attached. The magneto is mounted above the front motor arm at the right where it does not interfere with valve springs and is well removed from the carbureter. The water pump is located in front of the timing gear at the left side, and the belt-driven fan is carried on a bracket extending from the front cylinder casting. The ignition system is a Remy dual one. This system calls for a small non-vibrating coil on the dash and a battery for reserve. When the battery is used the voltage is stepped up through the non-vibrating coil and the current distributed through the magneto distributor.

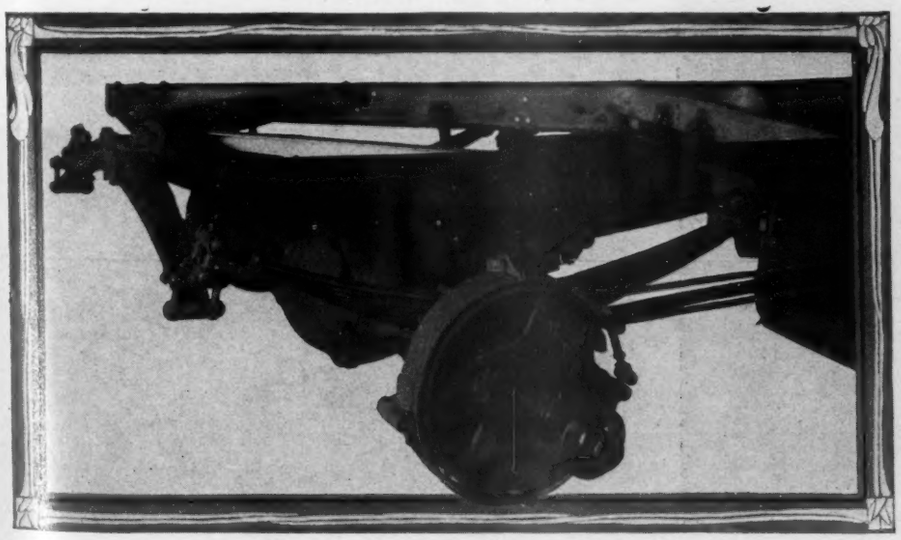


FIG. 5—REAR AXLE AND SPRING CONSTRUCTION OF 1910 GROUT CARS

Grout Transmission

The Grout transmission system begins with a leather-faced cone clutch which forms a corporate part of the flywheel, the cone portion having a 2½-inch leather face constructed on a 12½-degree angle. This cone has a 15-inch diameter. The spring thrust is absorbed on a ball thrust bearing. Back of the clutch comes a universal telescope joint which permits of dismounting the clutch. The gearset, Fig. 2, is a three-speed selective design with chrome nickel steel used in the shafts and gears, and Hess-Bright bearings employed for supporting the shafts. This set is a horizontal design with the gears incorporated in a one-piece aluminum casting. The mainshaft, on which the sliding members move, has two integral keys placed diametrically opposite and in the gears are corresponding keyways. Direct drive is obtained by meshing an external with an internal gear, the forward sliding gear of the set, shown in Fig. 2, lying against the gearbox has a double row of teeth—an internal and external set.

In the Realm of the

LAW HITS TAXICABS

THESE are indeed sad days for the taxicab companies in Boston, for on Thursday of last week the supreme court delivered a solar plexus blow to them while the state sealer of weights and measures prepared to hand out an uppercut. Think of it, if a person rides around all day or night in a taxicab in Massachusetts and then, tiring of the ride, decides not to pay for it he is not amenable to the laws. It is no crime to evade a fare in a taxicab. So say's the supreme court—and that is enough. Perhaps the insistent taxicab people that forced the issue are sorry they did not let well enough alone and be content with losing the $8.50 one James C. Goldman refused to pay them.

On August 5, 1909, Goldman hired a taxicab from the Taxi Service Co., and after riding about until he was tired he informed the driver that there was nothing doing in the way of pay. So the company promptly had Goldman arrested. The latter decided for some reason or other that he would fight rather than pay or have a criminal record put up against him. He was haled into court and charged with violating chapter 103, section 55, of the revised laws, that provides that whoever, with intent to cheat or defraud the owner thereof, refuses to pay for the use of a horse or carriage the lawful fare established therefor, shall be punished by a fine of not more than $20, or by imprisonment for not more than 2 months, or by both such fine and imprisonment.

When the case reached the superior court after an appeal from the lower court Goldman was found guilty. The complaint alleged that the defendant "did use a certain motor car, and did refuse to pay for said use of the motor car the lawful fare established by the police department." Goldman was not satisfied with the verdict and though it cost a good sum to go to the supreme court, he ordered his attorney to take the case there. The question hinged about the word "carriage" in the statute. The supreme court took up the matter and decided that a carriage was not a motor car, and that the framers of the statute had made no provision for the motor car, therefore Goldman was not amenable to the law and the judgment of the lower court was reversed, leaving the taxicabs in a rather peculiar position. This decision is along the lines of one made by this same court about a year ago in which it was maintained that motor cars as vehicles were not regarded as vehicles within the meaning of the statute, and therefore an owner could not recover damages to his car because of a defect in the highway. The decision is rather far-reaching, for it may be applicable to other states that have statutes where the word motor car is not specifically stated.

In its decision the court said: "It is certain that when this statute was originally enacted, the legislature, in using the word 'carriage' had no thought of a vehicle made up in large part of complicated machinery, and propelled by a powerful engine, whose operation is similar to that of locomotive engines on railroads. While such vehicle may be called a carriage in the broad sense that it is used to carry persons and property, it is not commonly referred to as a carriage, but is distinguished from carriages by another name to designate a vehicle of an entirely different character. We are of opinion that motor cars are not included in this statute."

The court says the defendant well contends that a criminal statute is always construed strictly in favor of the defendant.

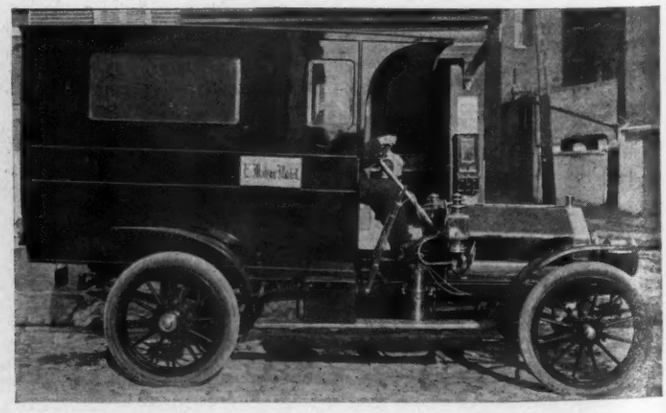
Naturally the taxicab company's officials were stunned. The only relief now in sight is to have the legislature amend the law. This will not be an easy task, however, for new legislation can only be admitted under a suspension of the rules. This must be done by unanimous consent, and so the objection of any one member of the legislature can hold the project up until next year. The taxicab people will try to have the legislature act on the matter at this time, for another year would mean hearings, advertising and all sorts of annoyances in the meantime.

The other trouble for the companies in Boston came when they went before Daniel C. V. Palmer, state sealer of weights and measures, the man who brought out the elaborate system of testing meters and sealing them, and asked for a lenience allowance of 2 per cent per mile in taxicab meters because of inaccuracy. General Manager Thomas P. Bankhart, of one of the taxicab companies, told Mr. Palmer it is absolutely impossible to secure meters that will register exactly, and unless some allowance is made for inaccuracy the taxicabs will be forced out of business. He submitted a statement from the chief engineer of the Franco-American Taximeter Co., of New York, to the effect that it is impossible to manufacture meters that will register the exact distance traveled. While Mr. Palmer took the matter under advisement he expressed himself as loth to make so great an allowance as 2 per cent per mile. It is only a short time ago that an arrangement was entered into with the consent of the Boston police commisioner so that the first 6 minutes of waiting should not be charged up in order that the charges would meet the legal requirements.

NATAL WANTS MOTOR SERVICE

Some time ago the parliament of the British colony of Natal, in South Africa, voted a credit of $50,000 to be used in purchasing motor cars for passenger and merchandise transportation. It appears that the country is making big strides and greatly developing its commerce. Transportation facilities are very unsatisfactory and the highways in general in bad con-

FRANKLIN PATROL USED BY CITY OF OMAHA



UNDERTAKER FINDS A MOTOR WAGON A CONVENIENCE

Commercial Car

dition, yet so great is the need for better traffic that the government will buy two Renard train-motor vehicles carrying people and goods and having trailers; two motor vehicles, each having one trailer, and two passenger motor trains to be used on rails and having a seating capacity for thirty persons. A correspondent in a letter to a continental publication says in part: "Not only in Natal, but in all of South Africa are the railroads comparatively inexistant. Those which are in operation only take care of the most important localities and often only one train a day is run. There is no doubt but here is a field for motor buses, motor trucks and Renard system trains. Manufacturers of industrial vehicles would find it well worth while to investigate the conditions and possibilities of southern Africa and sooner or later some will get big orders. The authorities in general will be only glad to coöperate and even pay large premiums for the introduction of the motor car public services. Naturally the manufacturers will have to make or bring down here vehicles which the authorities want, or at least such cars which will perform what they are expected to do. Some makers have been disappointed because the cars shipped did not come up to the requirements."

UNCLE SAM'S TRADE TIPS

Vice-Consul-General James J. McBride, of Winnipeg, says this will be an exceptional year in the motor trade in western Canada. He writes to Washington:

Orders are reported for 925 machines, valued at about $1,640,000, to be delivered before June, and the dealers state that the difficulty will be to secure enough machines to supply the demand. The western Canadian market wants a good grade of machine. While the average price of cars will be about $2,000, there is a good demand for the $3,000 machine. The four-cylinder engine is in greater demand than ever before. Its adaptability to most conditions and its usual reliability commend it. Another feature of this year's trade is the fully-equipped car. A couple of years ago the purchaser of a motor car paid the price for it and then bought his equipment extra. Now the machines are sold fully equipped with lamps, horns, etc. About 60 per cent of the machines owned in Winnipeg have operated through the entire winter. This is even true of the water-cooled cars. This is the first year that the motor business has been an active industry for the entire 12 months. The winter roads, when the snow is packed, are almost as good for driving as asphalt; and, when the occupants are careful, there is no suffering from the weather. Not only in Winnipeg is the outlook promising. Throughout the entire west orders for cars are reported in far greater numbers than ever before. The farmers are using gasoline farming machinery, and are beginning to realize the value of the motor car. Last year the business amounted to about $1,000,000, while the present estimates are that about double that amount will be invested in machines this year.

TRUCK AGENCY IN PITTSBURG

The Reliance Motor Truck Co. of Pittsburg has been formed by H. W. McMaster, receiver for the Wabash-Pittsburg Terminal Railroad Co., Peter K. Soffel real estate agent for that corporation, and Frederick James. The company will be located in a big garage centrally situated, and has secured the agency for western Pennsylvania for the Reliance truck.

PORT CHESTER BUYS MOTOR

The Pope company has delivered to the Port Chester fire department a combination chemical and hose wagon which differs from the usual type of machine of this make in that the tanks are located in the rear of the vehicle body. Each tank holds 40 gallons.

PRAISE FOR FRANKLIN

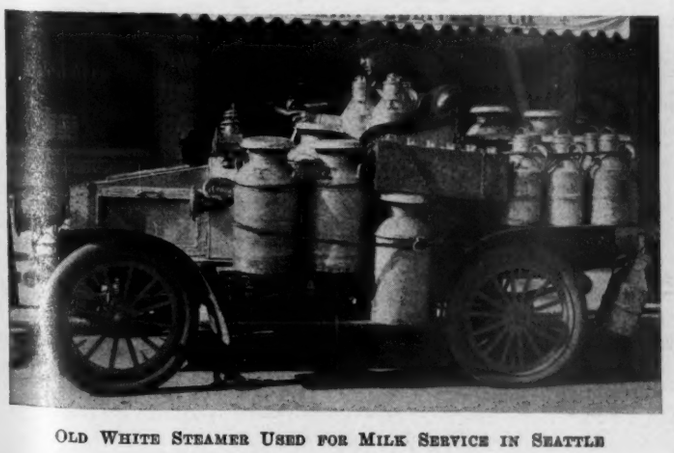
One of the features of the acceptance of two Franklin motor police patrols by the city of Omaha, Neb., last week, was the delivering to Guy L. Smith the Omaha Franklin dealer, of a certificate of perfect performance on the part of the Franklin which had done temporary service while waiting for the building of the motor patrols. The certificate bore the seal of the city and the signature of the mayor, and members of the fire and police commission. The certificate states that during the 97 days and nights that the old Franklin had been in service 1,303 calls were responded to without the Franklin missing one or delaying an officer a single minute. This should cause to pause those individuals who are fond of saying that a motor car cannot be depended on for reliable service after 2 years. The machine in question was 3 years old and was not built for police service, being the ordinary type of touring car.

USE FOR OLD CARS

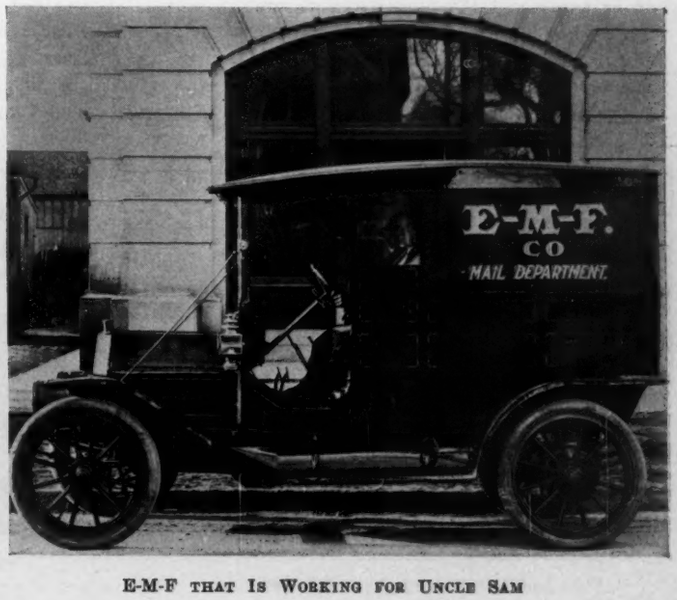
When horses outlive their usefulness in many instances they are shipped back to the farm. It is the same way with many motor cars. When they get out of style or the car is dropped by its owner or exchanged for another and later type, the old cars are shipped back to the farm. The Dairy Delivery Co., of Seattle, Wash., has many old cars in its service and they are all back to the farm castoffs, which unlike horses are still able to do fine work. Not only is the old White shown in an accompanying back to the farm car but it is in the front ranks with farm products loaded all over it. Reports state that it is doing excellent work.

HARTFORD HAS A HEARSE

The first motor-driven hearse in Hartford, Conn., is that now about ready for delivery to a local firm which has had a vehicle built at the shops of the Pope company.



OLD WHITE STEAMER USED FOR MILK SERVICE IN SEATTLE



E-M-F THAT IS WORKING FOR UNCLE SAM

The Motor Car Repair Shop

Hints for the Amateur

IT occasionally falls to the lot of the motor car repairman to replace the wire cable used as a means of flexible connection between the brakes, muffler cut-out, horn or sprag; and as the cable used for this purpose is exceedingly troublesome unless properly handled, a few hints on the subject may be appreciated. Generally, the first mistake one will make on handling wire cable for the first time is that of cutting off a piece of the required length without first binding the ends to be formed by the cut with cord or wire to prevent it from unraveling. In the upper sketch of Fig. 2 the proper precautions are taken, the cable being wrapped with wire C on either side of the point of separation before the cut is made. In the lower section of Fig. 2 is shown the clamp P, generally employed as an adjustable connection when wire cable is used on brakes. When replacing this cable a common error is that of making the wire just long enough to attach the clamp at the position P1 and cutting the wire at the point P2. This allows of no adjustment other than that of just taking up slack brought about by wear of the brake-lining and the stretch of the cable itself. If the cable is cut of sufficient length so the clamp can be placed at the position P, a wide range of adjustment is permitted, and when the cable becomes a trifle frayed at the point A, where it is attached to the brake-rod R, it can be let out at one end and taken up at the other, and entirely unworn portions of the cable brought into contact. In this way the life of the cable is prolonged.

Making Loops in Wire Cable

When it is desired to make a permanent connection such as attaching an end of the cable to the control lever of a muffler cut-out or sprag and the like, the most practical method is to loop the end of the cable through the eye of the lever and then bind the end of the cable with copper wire, as illustrated in Fig. 1. It is not an uncommon error for the workman to form and complete a beautiful loop and find he has neglected to attach the wire to the lever. In securing the loop the copper wire should be wound around it in the following manner: One end of the copper wire should be placed at the point T; then the wire should be laid along between the two portions of the cable, as indicated by the dotted lines B. The winding commences at the point S and continues back for about an inch, each loop of the wire being drawn as taut as possible. The end D of the cable now is cut off diagonally, as indicated by the dotted line E, and the winding continued till the end of the cable is entirely covered. The ends T and F of the wire are neatly twisted together and laid parallel with the cable. To complete the job, the winding is next smeared with soldering paste, heated with a torch, and solder applied; after the solder has run between all the loops of the copper wire, if the joint is wiped with tissue paper before the solder has cooled and set, a very neat job is obtained, and when complete should have the appearance of the sketch in the lower section of Fig. 1.

Speedometer Repairs

There seems to be a prevailing disposition on the part of many owners and repair-men, when the general annual overhauling of a car is in progress, to overlook or neglect those outside fittings which under ordinary circumstances, give very little trouble. In this category the speedometer comes in for no small share of neglect. When the car goes into the shop, this instrument is generally disconnected, then carefully laid away with other fittings until the time comes for their replacement, and that is often all the attention it receives. On the other hand, if the owner has been having trouble with the speedometer, he reports the matter to the repairman and then it too receives attention. The busy repairman, however, never attempts to repair the internal mechanism of a speedometer, but sends it immediately to the nearest speedometer agent or expert, which is as it should be. It is folly for a repairman, driver or owner not familiar with the construction and characteristic troubles of a speed indicator, to waste his time and perhaps damage the instrument, just to satisfy his curiosity, or to fix something—he knows not what—without the ability or the special tools required to do it.

All reputable manufacturers of these instruments have agents in the larger cities throughout the country who have in their employ skilled mechanics who do nothing else but apply, overhaul and regulate them; the shops of these workmen are equipped with special tools and devices without which the necessary repairs or adjustments are most difficult and perhaps impossible; the troubles to which the speedometer are subject are comparatively few, and usually of such nature as to be quickly remedied under proper treatment; with the knowledge of the expert and aid of his special appliances 5 or 10 minutes is all the time required to learn the cause of the trouble, and in most cases the most extensive repair and adjustment requires less than 30 minutes. What is more, no charge whatever is made for the services of these workmen, as it is the desire of the manufacturers and dealers to keep their instruments in first-class condition. Motor Age begs to remind its readers that the speedometer is on the job whenever the car is in motion, that it too requires the attention of an expert about once a year; and that it is advisable and practicable to take advantage of the free services of the manufacturers' representative when the instrument is in need of repair or adjustment. Write the maker of the instrument, learn the whereabouts of his nearest repair depot, then send it in by express. The express charges will be less than the cost of the generally inefficient repair of the local jeweler or repairman, and a satisfactory job is assured.

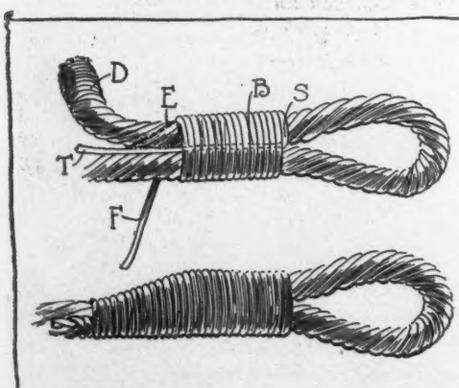


FIG. 1—MAKING LOOP IN WIRE CABLE

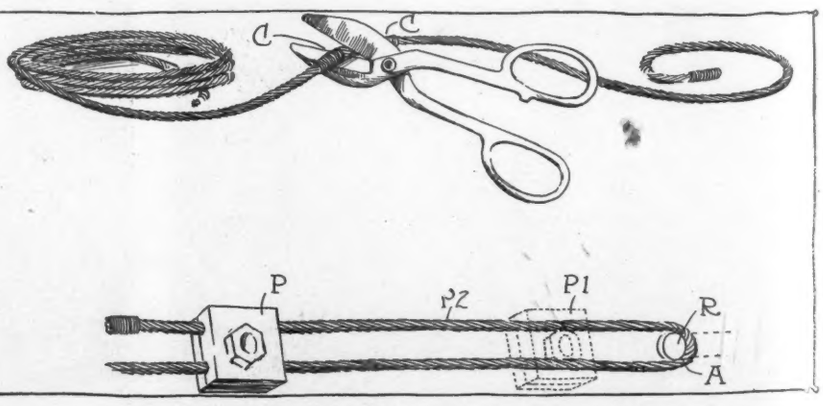


FIG. 2—HINTS ON HANDLING CABLE

Current Motor Car Patents

Ignition Timer — No. 952,166, dated March 15; to Gilbert Wright, Schenectady, N. Y. This timer, Fig. 3, is unlike the conventional type of ignition timer generally employed in motor car construction in that the casing is the rotating part of the mechanism. The hub remains stationary except for its freedom to oscillate between certain limits in order to advance or retard the spark in the engine. The timer illustrated is designed for a six-cylinder motor, and comprises: a tubular hub H, through the center of which the primary wires P and the ground wire G pass to their respective contacts; insulated contact spools I, supported in flanges of the hub H, provided to make connection with the contacts C of the rotating case; a driving-shaft S on which the timer is mounted, and secured by the set screw W; adjustable ball bearings to support the hub H, and a lever L secured to the hub by the set screw R and provided for the attachment of the control rod.

Differential Driving Mechanism—No. 951,915, dated March 15, to Charles H. Johnson, Canton, O. This invention consists of a differential mechanism which allows of the necessary differential movement or freedom necessary to secure the proper rolling motion of the wheels in rounding curves, with the added advantage of having the driving power always applied to the slower moving wheel. The construction of this mechanism is illustrated in Fig. 4. The bevel gear G of the driving mechanism has the housing or the differential mechanism formed integral with it, and its only attachment to the shafts S and S1, is by means of friction

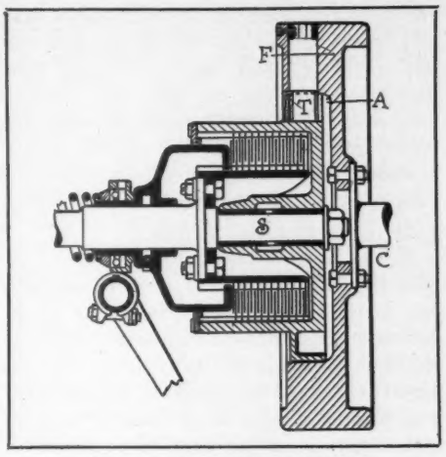


FIG. 1—A UNIVERSAL JOINT

clutch devices operating between the inside of the drum or housing H, and the disks D and D1, which are attached to the squared ends of the axle shafts. These clutch devices consist of a spring-controlled roll for each disk, which is adapted to wedge in between a recess in the disks and cam faces on the inside of the driving drum H. There is a spacing block between the rolls with a centering plate frictionally held between the disks.

Carbureter—No. 952,326, dated March 15; to Franklin W. Hagar, Nashville, Tenn. This patent relates to a carbureter of the float-feed type. As indicated in Fig. 2, the gasoline enters the carbureter at the opening O, passes through the strainer R, enters the float-chamber F through the needle-valve N, and flows through the ducts D into the spray nozzle Z. As the air which is drawn in at the bottom of the carbureter passes up as indicated by the arrows, it passes the opening of the annular space between the bottom of the spray head H and an adjustable annular choke ring C, which space is in communication with the annular space between the inner wall of the spray head H and the outer wall of the tubular part T. This sucks the gasoline from the spray-nozzle Z, through a series of perforations P, in the tubular part T; and carries it up into the mixing-chamber M, and out past the butterfly-valve V, to the intake pipe of the motor. No needle valve is employed to control the supply of gasoline drawn from the spraying-nozzle, this adjustment being controlled by air regulated by means of the adjustable valve V2. The threaded sleeve A raises or lowers the choke-ring C which regulates the residual air supply, and the spray-head H raises and lowers automatically, regulating the spray of gasoline admitted to the mixing-chamber according to the speed or suction of the engine.

Universal Joint—No. 951,235, dated March 8; to Cysille Cotton, Lyon-Monplaiser, France. This patent as shown in Fig. 1 applies to a universal coupling between the flywheel of a motor and the transmission mechanism. The clutch-cup C is loosely mounted upon the driven shaft S. Externally it is adapted to fit into a cylindro-spherical recess A in the flywheel F, in which it is allowed an angular movement, but made to revolve with the flywheel by means of radial tenons T, trunnioned in the rim of the flywheel, whose flattened ends engage with corresponding grooves cut longitudinally in the clutch-cup edge.

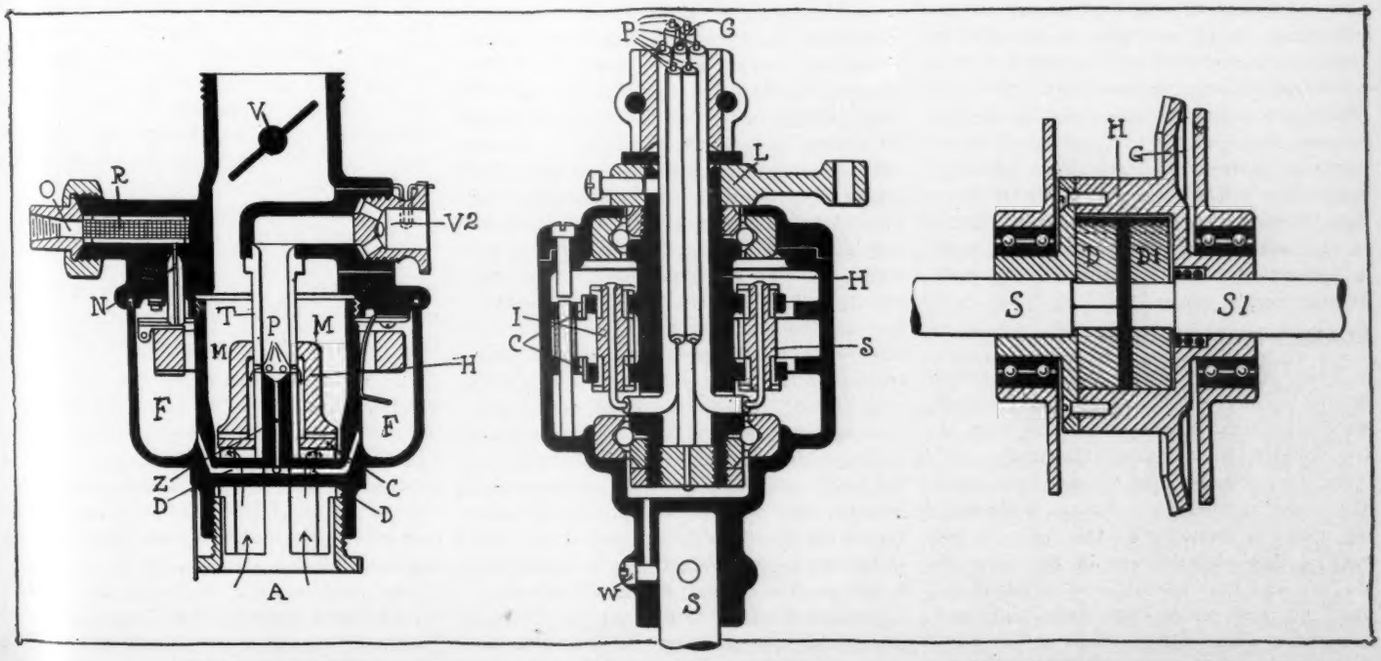


FIG. 2—CARBURETER FIG. 3—IGNITION TIMER FIG. 4—DIFFERENTIAL MECHANISM

Legal Lights and Side Lights

BOY WAS CARELESS

A DECISION lately rendered by the supreme court of Michigan is one that will attract favorable comment from motor car drivers. The facts in Zoltorski vs. Gzella, 124 N. W., Michigan, 527, showed that the plaintiff was a small boy playing tag in the street, and that he was taking absolutely no precautions to see if a vehicle of any kind was near him. The supreme court affirmed a judgment of the lower court which was for the defendant, the driver. The facts were these: "The plaintiff was a boy 13 years old. He was playing tag in a public street, and, having tagged a companion, started to run across the street pursued by the older boy. As he crossed, he ran into or was struck by a motor car driven by the defendant. There was testimony tending to show that the car struck him. If so, it is clearly demonstrable that he ran directly in front of the car, and was struck, while his companion saw the car, and stopped before getting in the way of danger. The accident occurred about 30 feet from the intersection of two streets, at a place well lighted by an arc and other lights. * * * The learned circuit judge found that the plaintiff, the boy, was guilty of contributory negligence, in that he ran immediately in front of the machine, and he directed a verdict for the defendant, and plaintiff has appealed. * * * The evidence indicates that the boy was careless in not seeing the car."

The court in part says: "The only question is one of law. Was it contributory negligence in a 13-year-old boy to become so engrossed in play as to run across a city street and immediately in front of an approaching motor car without thought to look to see whether such a machine or any other vehicle was approaching? * * * While the injury to this child necessarily arouses the sympathy of all observers, it does not warrant the imposition of damages upon one who is not shown to have been blamable in the premises. A verdict in this case would be, as the judge well said, a bestowal by the jury of charity from another man's pocket."

BLAMES PEDESTRIANS

Where the defendant, driving a motor car on a city street, struck the plaintiff while approaching him from the rear as the plaintiff was crossing diagonally, and there was evidence that the accident could have been avoided by defendant's slackening speed or swerving to the right, it appearing that plaintiff was in full view of the car and that he continued straight on until he was struck, the defendant was chargeable with negligence, says the court in Diamond vs. Cowles, 174 Federal, 571. A pedestrian crossing a public street diagonally, being entitled to assume that the drivers of a motor car approaching from the rear would run the same at a controllable speed and would avoid running him down while he was on his original course, plaintiff was not negligent as a matter of law in failing to take steps to avoid injury.

CAN USE ALL OF STREET

In an action for injuries received by plaintiff in a collision of a motor car with his bicycle—Johnson vs. Shaw, 90 N. E. Massachusetts, 518—it appeared that the accident occurred at the junction of two streets, and that the driver of the motor car was turning around to go back in an opposite direction on the same street on which he came. The lower court gave a charge to the jury to which the defendant excepted. Upon appeal the supreme court of Massachusetts affirmed the instructions given by the trial judge and overruled the exceptions. The instructions are:

"You are to take all the evidence, all the circumstances, and determine whether the chauffeur was doing anything he ought not to have done under all the circumstances. He had the right to make that turn. He had a right to use any part of the street that he was coming into, subject only to the rights of other people who might be there. If two vehicles meet in the street, it is the duty of each one of them, as seasonably as they can, to get each on his own right hand side of the traveled way of that street. But that law does not compel a man always to be on the right side. He can use any part of the street, so long as he is not interfering with the rights of other people, and the fact that this accident occurred on the right-hand side of the street is only another piece of evidence to be considered by you. You are to consider whether Peterson, the chauffeur, was endeavoring, in making a turn, to get on the right-hand side near the hydrant, where, under certain circumstances, he properly belonged."

CAUTION IS NECESSARY

In a recent Connecticut case, State vs. Campbell, 74 Atl., Conn., 927, the defendant was convicted of manslaughter and was sentenced to 10 months' hard labor in the common jail for running into one Morgan with his motor car and killing him. The facts were in dispute, the two accounts varying widely as to the possibility of avoiding the accident, the rate of speed of the motor car, and the care used by the driver. The court below in instructing the jury read from the Connecticut statute which attempts to lay down the rule of conduct for drivers of cars in that state: "Upon approaching any person walking in the traveled portion of any highway . . . and also in passing such person . . . the person operating a motor vehicle shall have the same under control and shall reduce its speed." The lower court then commented on the statute, and by way of interpretation said: "Now, that means that from the time the person operating sees, or in the exercise of ordinary care should have seen, a person walking in the highway he shall so reduce his speed, if reduction is necessary, and so bring his motor under control, so far as practicable, within the time after he observes a person in the highway, that he may by exercising control avoid injury to the pedestrian."

OF INTEREST TO MAKERS

The measure of damages for breach of contract binding one to build a body and place it on a chassis furnished by another, and to furnish other materials and make repairs on the machine, is the reasonable cost of making th work and materials conform to the contract; and evidence of the value of the chassis and of the value of the machine after the work contracted for had been performed is inadmissible." This was in Anthony vs. Moore & Munger Co., 120 N. Y. Sup. 402.

Legal Motoring Angles

No. 4

Advice which will prove valuable to garage men who make a practice of renting cars is given by Xenephon P. Huddy in his book the "Law of Automobiles." Mr. Huddy points out that the garageman must deliver the car in condition to be used and that he cannot interfere with the hirer's use of it when the latter's interest is in it or right in it continued. Strange as it may seem, the owner of the car cannot repossess himself of his property if the hirer abuses it unless he can do so peaceably. The proper step for him to take in case the hirer refuses to give up the car is to bring an action. If such misuse of the car terminates the original contract of bailment, the owner may demand the machine and on refusal bring trover or in some cases he may bring the action of trover without demand. During the time the car is rented out it must be kept in repair by the owner and in case the hirer has to do it himself the owner must repay him. By the contract of hire the hirer acquires a qualified property in the car which he may maintain against all persons except the owner and against him as far as the terms and condition of the contract, expressed or implied, may warrant. During the time for which the hirer is entitled to the use of the car the owner not only is bound not to disturb him in that use, but if the hirer returns the car to the owner for a temporary purpose the latter is bound to return it to the hirer.

News from the Motor Clubs

Spring Tour Planned—The Ross County Automobile Club, of Chillicothe, O., has decided to hold a spring tour, some time in May when a run will be made to Lancaster and return in 1 day. Permanent headquarters for the club have been opened.

Will Prosecute Offenders—The Wisconsin Valley Automobile Club, member of the Wisconsin State A. A., has issued a notice that it will prosecute to the fullest extent of the law all violators of the laws and ordinances limiting the speed of motor vehicles, whether or not they are members of the club.

A. A. A. Radiator Emblems—The American Automobile Association has just received the first consignment of brass radiator emblems, which are of an attractive design, containing the letters A. A. A. surrounded by an oval rim of brass. These emblems will be given to the individual members of the A. A. A. and sold to club members for the nominal sum of 25 cents.

Columbus Chairmen—At a meeting of the board of governors of the Columbus Automobile Club, of Columbus, O., chairmen for the various standing committees for the year were named as follows: Membership, M. J. Hanley; legislative, Herman Hoster; shows and contests, Perin B. Monypeny; roads and road signs, Rev. J. H. Dodshon; house and entertainment, William M. Frisbie; publicity, Charles C. Janes; auditing, A. O. Glock.

Requests Observance of Laws—W. R. Seely, town clerk of Hammonton, N. J., on the main thoroughfare between Camden and Atlantic City, has requested the American Automobile Association to warn motorists so far as possible against fast and reckless driving of motor vehicles on the main streets of that town, and particularly at the sharp corner at the junction of Main road and Bellevue avenue. Mr. Seely states that notwithstanding the signs requesting motorists to go slow at that point these public requests are frequently ignored.

Enthusiastic Here—Few counties in any state in the union has as many clubs affiliated with the American Automobile Association as Worcester county, Mass., and the members of the clubs play an important part in the Massachusetts association as well as the national organization. At the present time there are in Worcester county four clubs that have membership in the A. A. A. and this is nearly half the number in the whole state of Massachusetts. The four Worcester county clubs all begin with a W and are the Wachusetts, Winchenden, Worcester and Webster. The Worcester Automobile Club is the most prosperous, and the present indications point toward the club being one of the first ten in the United States before another year rolls by as the membership is gradually increasing, and will soon reach the 1,000 mark.

Oregon Booms A. A. A.—Work of the Oregon State Automobile Association is progressing rapidly. A thorough canvass of the state is to be made within the next few weeks, during which pressure will be brought to bear upon every owner in the state looking towards getting him to join the association.

Omaha After Good Roads—A mass meeting will be held in Omaha, Neb., April 8 in the interest of good roads. A. N. Johnson, state engineer of Illinois and other well-known road experts will be invited to address the meeting. The gathering is intended to signalize the campaign for better roads in Omaha and Douglas county. The Omaha Automobile Club is taking a lively interest in the affair.

Spokane Awake—At the meeting of the Spokane Automobile Club, of Spokane, Wash., it was decided to combine forces with the state good roads commission for the betterment of road conditions in Spokane and tributary counties. Last year the club acted independently in a measure from the state organization, and on the grounds that the greatest good can be accomplished by united action will pursue a new policy in the future. Application will soon be made by the club for the sanction of the American Automobile Association for the holding of races during the interstate fair next fall. A hill-climbing contest also will be introduced.

Many at Syracuse Banquet—The annual banquet of the Automobile Club of Syracuse, of Syracuse, N. Y., attracted about 200 guests. Since the last annual banquet more than 200 new members had been secured, making the total number on the roll at present over 450. On the first of last July a permanent office was opened in the S. A. and K. building. Since the opening of the office more than 600 tourists have called, the majority of whom received routings or information regarding roads. By a system adopted by the club a complete record is always kept of road conditions in every direction from Syracuse so that tourists can be advised from time to time as to the existence of speed traps, bad bridges or stretches of road. A complete file of catalogs of the American manufacturers is kept for the benefit of prospective buyers, and Blue Books, pennants and buttons are kept for sale to members. President Smith predicted that before another year had rolled around the club membership would have been increased by another 200. Mayor Edward Schoeneck was the guest of the evening. District Attorney George Bond also asked for the coöperation of the club in apprehending reckless drivers who endeavor to evade recognition and capture after running down their victims.

Fourteen Clubs Admitted—As a marked indication of the continued growth in motoring and all that pertains to it, a new record was established last week at the annual meeting of the New York State Automobile Association when fourteen newly organized clubs throughout the state were elected to membership in the New York State Automobile Association.

Sigh for the Country—The members of the Columbus Automobile Club, of Columbus, O., are casting about for a suitable country clubhouse to be used during the present season. It is proposed to have a clubhouse on some good road, where the members of the club can enjoy the country. A golf course will be necessary to make the site satisfactory.

Interclub Match Dates—The interclub reliability team match between the Long Island Automobile Club and the Crescent Athletic Club, of Brooklyn, will take place on Long Island May 21 and 22. The route as laid out calls for a start from the home of the Long Island Automobile Club, where breakfast will be served; lunch will be had at Patchogue and the night stop will be at Westhampton. The return will be by the north shore and the noon stop will be at Centerpoint. Each day's journey will be about 125 miles in length.

Milwaukee Club's New Home—The Milwaukee Automobile Club met on March 24 to consider the purchase of an additional acre of land adjoining its present holdings on Cottrill and Blue Mound avenues, Milwaukee, and the erection of the proposed clubhouse. No definite action was taken, and another meeting will be held April 7. The club profited to the extent of $4,000 from the second annual motor show, and now has nearly enough money to pay for the clubhouse, which will cost $10,000 to $12,000. It will be a rural clubhouse, just beyond the city limits.

Points Out Danger Point—The Buffalo Automobile Club last week sent a communication to the board of aldermen recommending that Main street north of the New York Central Railroad company's tracks in Buffalo, be widened. The Williamsville road, one of the most traversed thoroughfares in that section of the state, starts at the Main street city line and in the summer there is a vast amount of motor car traffic on that portion of the thoroughfare. So much, in fact, that in the present width of the street and the amount of traffic on the roadway it is dangerous driving in the opinion of motorists.

From the

APRIL FOOL'S DANCE—The Century Motor Club of Philadelphia is laying plans for its next sociability run. A novelty in the social line will be an April Fool's dance on the first of next month, while a Bohemian vaudeville smoker is underlined for the 15th.

Entry Fee $1,000—The entry fee for the Mount Baldy race, a Pacific coast classic, has been set at $1,000 by William Ruess, last year's winner, who has the right to dictate terms. Ruess again will drive a Pope-Hartford, while Harris Hanshue will pilot the Apperson Jackrabbit. An Isotta also is mentioned as one of the possibilities in the entry line.

Franklins Will Carry Mail—Two six-cylinder 43-horsepower Franklin touring cars are to carry the United States mail and passengers between Boring and Government Camp at Mount Hood this summer. Emmett Donahue, who is to manage the state line and run one of the cars, holds the contract for delivering the mail this summer, and found it necessary in order to keep up with the times to put in motor cars. The route is an especially hard one.

Car Thief Punished—Albert Hermann, aged 20 years, of Milwaukee, Wis., was sentenced to serve 2 years in the Wisconsin state reformatory on pleading guilty to the charge of breaking into the private garage of George D. Sheriffs, Milwaukee, stealing his touring car and riding around in it for 2 days, damaging it considerably. The car was abandoned in a distant part of the city. The sentence is the heaviest yet imposed under the new statute aiming to stop thefts of this kind.

City After Money—An ordinance was this week introduced in the Toledo council determining the district within which the speed of motor cars shall not exceed 8 miles per hour and that where they run 15 miles per hour. While the state law is effective for purposes of regulating speed the fines collected from prosecutions goes into the state coffers instead of the city treasury. By fixing the city ordinance to correspond with the state law it is possible to prosecute under the ordinance and thus save to the city the money derived from fines for its violation.

Many Want the Road—The Milwaukee county board of supervisors may not wait for the enactment of the highway bill prepared by the special joint legislative committee on good roads to boulevard Grand avenue from the Grand avenue viaduct, the Milwaukee city limits, to the Hawley road, and eventually to the limits of the county, whence it will be extended to Madison, the capital of Wisconsin, 85 miles away. Steps will be taken at once to acquire the necessary land. Many property owners have offered to give the county a strip of land 120 feet wide with the understanding that it is to be boulevarded. Thirty owners appeared before the board recently and begged that the improvements be pushed. The proposed highway law definitely decides the apportionment of money to county, township and city and may be enacted before work is actually started.

Would Improve Road—One of the particularly bad stretches on the Philadelphia-Pittsburg route is the Lewistown Narrows, deep ruts and huge stones making the going extremely difficult, if not dangerous. A determined effort is to be made by Philadelphia, Pittsburg and Altoona motorists to improve the road. The Lewistown people realize the importance of the movement, and the local board of trade has appointed a committee, consisting of E. F. McCabe, A. J. Yeager, Thomas Johnson, Walter Fosnot and Lew D. Stern, to arrange for a meeting in Lewistown, April 22, of all interested parties.

Another Through Highway — Massachusetts will have a third through highway north if the aggressive representatives of Essex county in the legislature can have their way. They have put in a bill to make the old Newburyport turnpike a state highway or have it fixed up at the expense of the state. The highway commission is willing to put the road in shape, but not take it for a state road just yet. This road was laid out in 1803 and follows an air line from Boston to Newburyport. It is much used in summer by motorists, but the towns through which it passes have neglected it as it was no benefit to them, passing through the outskirts of their territory. If it is repaired by the highway commission it will lessen the distance between Boston and north shore points a number of miles, and also relieve traffic on the boulevards, thereby saving in maintenance of the latter in a couple of years enough to pay for the work, which is estimated at $35,000 for the 30 miles.

Lebanon Holds Election—At the annual meeting of the Lebanon, Pa., Motor Club, last Saturday night, Grant W. Nittauer was elected president; James F. McGovern, vice-president; William S. Davis, secretary; Elmer E. Hauer, treasurer; A. S. Kreider, H. H. Light, Dr. Frank B. Witmer, Charles L. Weimer and A. G. Reizenstein, directors. The contest committee is arranging for a roadability run in the near future.

Worcester's New Hill Schemes—The officers and directors of the Worcester Automobile Club, of Worcester, Mass., have announced that the club's annual Dead Horse hill-climbing contest will be held during the early part of June. For this contest the Worcester club now has a course with nearly ideal conditions, embodying some new and popular features, the principal one being that of having a grand stand at right angles to the road, and over it, so spectators can see the cars. Another new feature will be that of an extra wide road, wide enough for its entire length to allow two cars climbing the same time, which no other hill course in the country has. The course is some distance from the old Dead Horse hill and was built from start to finish at a cost of $20,000. It will be coated with Hassam pavement, same as on the Long Island motor parkway. The rise of the new hill course is 489 feet, with grades varying from two short dashes of 3 per cent each to one at

TOURING PARTY IN THOMAS AT NEW YORK MAPLE SUGAR CAMP

Four Winds

the finish of 25. The average is about 15 per cent, lowered by the places where the road is not steep, but the ascents of 24, 21, 17 and 25 per cent will be a thorough test for the cars. The old hill-climbing course of the club rises but 325 feet in the mile, which is 164 feet less than the new course.

New Orleans Wants a Show—Plans are afoot in New Orleans for the holding of a combined motor car, motor cycle and motor boat show in the last week of November, 1910, or the first week of December. The 2 days following the show it is proposed to have a race meet. It is planned to have about 20,000 square feet of space, with an elaborate electrical display. New Orleans never has had a show and it is believed it could be made a success.

Detroit Landmark—If anyone desires seeing the interesting as well as the historical things in this world there is no way of doing it as well as with a motor car. In the neighborhood of nearly every city in the country is something which the lover of the open air will enjoy driving their car to. The accompanying picture shows one of these ancient relics in Palmer park, near Detroit, with the owner of a Cartercar paying it a recent visit on a bleak winter day. This ancient old bell, whose surface has become a rusty green from more than a century of exposure bears an inscription which translated reads "Made by Paul Gonez in France, April 12, 1793." It is said that after being used by the monks in Spain for a time it was shipped to the West Indies and was used at a mission while the country was in a wild state. Finally the mission was burned and the bell was received in Detroit with a lot of other scrap brass by a concern which was known as the Frontier Iron and Brass Works. A Detroit business man happened to learn of it and he and a committee bought and presented it to Thomas A. Palmer in 1888 upon his return from the senate in Washington.

Oregon Road Men Meet—A good roads meet was held at Woodburn, Ore., March 19, and a number of road bonding systems were discussed. The meeting was addressed by Judge L. R. Webster, president of the Oregon Good Roads Association, who explained the different systems and the different measures which will be presented to the legislature.

Five Trophies Secured—Five trophies have been announced up to date as a portion of the plunder to be hung up by the Norristown, Pa., Automobile Club for its annual endurance run to Scranton and return May 18-19. The Norristown chamber of commerce has contributed a massive silver trophy, while McDonald & Campbell, Consolidated Rubber Tire Co., J. H. McCullough & Son and Bailey, Banks & Biddle have donated equally valuable emblems.

Dream May Come True—William E. Robertson, president of the Buffalo Chamber of Commerce and Manufacturers' Club, has announced the appointment of committees for the coming year and among them is the Niagara boulevard committee. It is composed of men well known in the motor car field in that city, including George K. Birge, president of the Pierce-Arrow Motor Car Co., chairman; George C. Diehl, John M. Satterfield and others. Mayor Fuhrmann has sent a communication to the board of aldermen of that city urging speedy action on this subject. It now seems as if the dream of motorists for a boulevard from Buffalo to Niagara Falls will soon be realized.

CARTERCAR OWNER VISITS HISTORIC DETROIT LANDMARK

Harrisburg's Itinerary—The itinerary of the fourth annual endurance run of the Harrisburg Motor Club will include the majority of the larger New Jersey coast resorts south of and including Atlantic City, including Ocean City, Sea Isle City, Wildwood and Cape May.

Sustains State Aid Law—The state supreme court of Washington has sustained the constitutionality of the 1907 state aid law. The law provides for joint contributions of county and state funds to be expended under the direction of the state highway board and construction of public highways.

Louisville Wants a Climb—There is a movement on foot among the Louisville motorists to hold a hill-climb in this neighborhood. A meeting is to be called to consider plans for such an event. Silver Hills, near New Albany, Ind., and Black Ridge, near Shelbyville, Ky., are spoken of as places for the hill-climb to be held.

Atlanta's Racing Plans—After much juggling to prevent conflicts in dates between grand opera matinees and aviation contests and speedway races it has been at last announced that Atlanta's 2-day aviation meet will be held at the speedway May 2 and 3. Then a day will be skipped and on May 5, 6 and 7 the speedway motor car races will be held.

Police Call for Cars—The chief of police and the police commissioners of Buffalo this week recommended to the board of aldermen that several motor cars be purchased for the police department of that city. The recommendation stated that the time demanded motor cars and that they were absolutely necessary for the efficient and up-to-date work of the department.

Counts the Packards—To ascertain the relative number of Packard cars passing over Commonwealth avenue, Boston's most heavily traveled motor thoroughfare, a count was kept on 2 days last week in front of Alvin T. Fuller's service depot. Cars entering or leaving the depot were not counted. On the first day between 9 a. m. and 5 p. m. of 1,050 machines passing 325 were Packards.

Company Is Sued—The Gove Automobile Co., of Milwaukee, Wis., will be required to pay the sum of $1,750 as damages for the death of Mathias Karuth, according to the verdict of the Milwaukee, Wis., circuit court in the suit of John Karuth. William Gaston, a negro employed by the Gove concern took a car out of the garage at 5 o'clock one morning more than a year ago for a joy ride and just as he left the garage ran over a boy going for milk. Gaston was convicted of manslaughter and is now serving a 5 years' sentence. The Gove company will appeal the case.

Development Briefs

Elba Electric-Lighting System

THE Willard Storage Battery Co., Cleveland, O., manufactures theElba electric-lighting system for motor cars, and which consists of a generator for furnishing electricity, a storage battery into which this electricity is delivered, an ammeter, and an automatic cut-out. When the engine is running the generator furnishes current until the battery is fully charged, at which point the generator is automatically cut down until the battery falls below its maximum, at which time the generator again supplies sufficient current to renew the battery. When the battery is full and the car running, the generator furnishes current direct to the lamps, but should the car stop, the electric current for the lamps is taken from the battery. The generator, Fig. 2, is made in accordance with those used for lighting railway cars, being a slow-speed, uniform-voltage type, with automatic regulation. This regulation is regardless of the motor speeds. If the battery is entirely discharged the current furnished by the generator will be its maximum, and as the battery becomes charged the automatic regulation cuts the current supply down.

The storage batteries used in conjunction with this generator are 6 volts 120 amperes, 6 volts 150 amperes, 6 volts 180 amperes, 12 volts 60 amperes and 12 volts 90 amperes. Either voltage may be used for the generator system. These batteries are of the same construction as those used on railroad trains. Each element is placed in an individual cell and the containing oak case is impregnated with acid-proof compound which makes the wood acid-proof. Each cell has an independent set of terminals leading from the elements, which is to guard against local action of the cell. These batteries may be

FIG. 1—SWITCHBOARD FOR CAR LIGHTING

carried in a pressed steel box on the running board, the boxes varying in length from 12 to 20 inches. The generator is supported from the side members of the frame and driven by belt from a pulley in rear of the flywheel or by other means direct from the flywheel.

The switchboard containing the ammeter is shown in Fig. 1. The ammeter is of the moving coil type. The needle of it normally stands at 0. When the battery begins to charge the needle deflects to the right in proportion to the current flowing into the battery, but when the battery is filled and is automatically cut down the defection of the needle is small. When the engine stops the current is automatically cut off from the generator.

The wiring diagram shows the general scheme employed for two headlights, two dash lamps, a tail light and the meter lamp. The connecting cables are combined in one large tube and are made in length to suit any type of car. The ends of the individual cables have terminals of different colors, namely, red for positive and gray for negative, and as the terminals of the generator are similarly marked with these colors there is no difficulty in connecting up the system.

New Eisemann Magneto

The Eisemann Magneto Co., New York, has brought out an innovation in connection with this magneto which is a device for automatically timing the ignition, thereby taking away the control of the spark from the driver. The automatic timing is accomplished by governor weights inclosed in a housing forming a part of the magneto. The detail in connection with the timing is as follows: The spreading of the governor weights, due to increased speed of rotation, and their coming together on low speeds, is transmitted to a sleeve which moves in square thread and which sleeve acts on the armature shaft, moving it angularly with respect to the driving shaft, so that the moment of maximum current, that is, the moment that the platinum points break contact, is made to occur earlier or later. In connection with this magneto its proper setting is simplified by means of a key, which is inserted in the rear portion of the regulator housing. This key fits two sides of

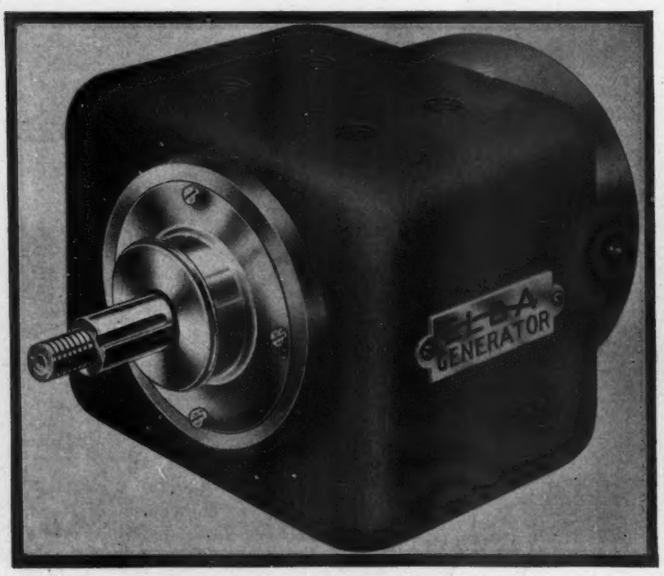


FIG. 2—ELBA GENERATOR FOR LIGHTING

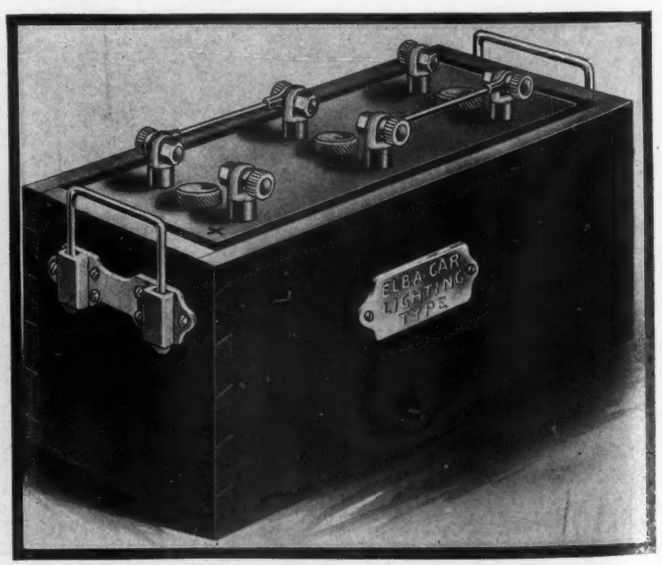


FIG. 3—ELBA LIGHTING BATTERY FOR CARS

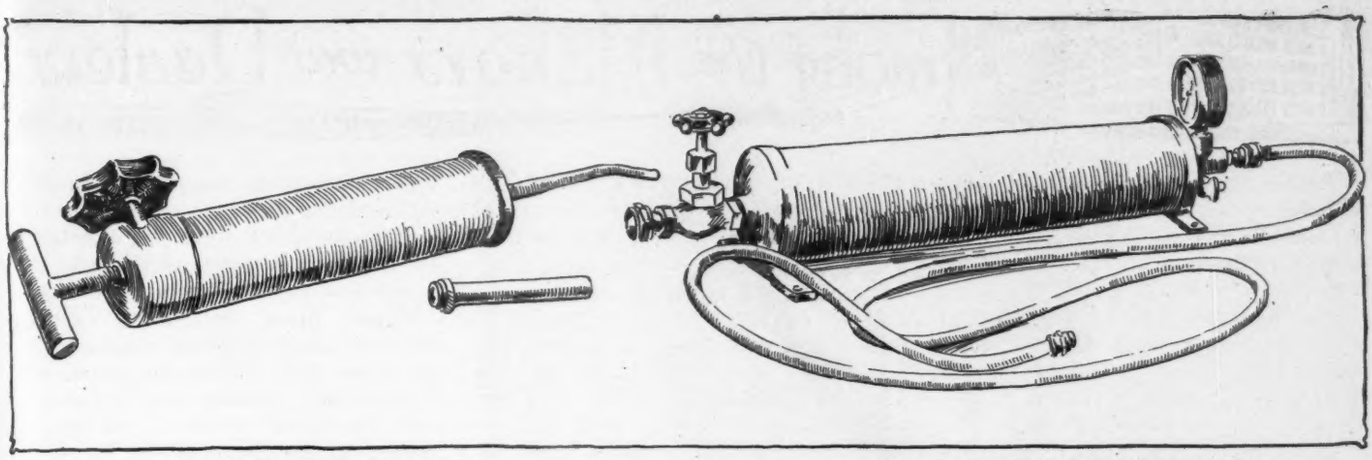


FIG. 4—THE BROWN GREASE GUN

FIG. 5—THE H. & C. TIRE INFLATOR TANK

the sleeve which is rigidly connected to the armature shaft. When the key is inserted, the armature shaft is held stationary in the position in which the platinum points begin to move away from each other. It is no longer necessary to look at the make-and-break mechanism in order to ascertain if the contacts begin to open at this moment. Owing to the fact that the driving shaft is held rigidly to the key it is possible to properly mount and draw up the driving coupling without fear of the shaft being shifted from its proper position.

The H. & C. Tire Inflator

The H. & C. Tire Inflator Co., Dayton, O., has on the market a tire inflator which consists of a cylinder carried on the running board and connected with the explosion chamber of the rear cylinder of the car, so that with every explosion a part of the exploded gases enters this tank, maintaining a constant pressure in it. The connection between the tank and the cylinder is a ⅜-inch copper tube, in connection with which is a non-return valve, preventing the gas backing up into the cylinder. In this tubing is also placed a filter which is claimed to remove the oil from the gases. Pressure is indicated at all times by the pressure gauge which is attached at one end of the tank, in a position where it may be readily inspected at any time.

Banker Windshields

For this year the Banker Windshield Co., Pittsburg, Pa., makes four styles of windshields, designated respectively, Nos. 1, 2, 4 and 5. The No. 1 shield has a one-piece glass carried in a ⅜-inch channel of the brass framework. The frame tubing is 16 gauge and ⅞-inch diameter. The No. 2 shield is the divided type, without any framework between the halves of the glass. This shield has a double fold, namely, the upper and lower halves fold alongside of each other in a horizontal position over the hood. If desired, the upper half folds alongside the lower half, which remains vertical in its regular position. The No. 4 shield differs from Nos. 1 and 2 in that the lower half anchors in the dash, permitting of only folding the upper half. The No. 5 angular shield is specially constructed for runabouts and roadster types and is a double-fold design, in which the lower half of the shield, anchored rigidly to the dash, is brought back towards the driver at an angle of 60 degrees, at which point it rises in a vertical position sufficiently close to the driver to give him the desired protection. In Fig. 7 is shown the method of inserting the glass in these windshields into the tubular brass framework. The frame member T contains in one side a deep groove into which is fitted a rubber packing R, which rests between the glass G and the tubing T, so that rattling of the glass is eliminated and the chances of the glass breaking being also greatly reduced.

Brown Oil-Grease Gun

The Brown Co., Syracuse, N. Y., manufactures a combination oil and grease gun, the cylinder of which is 8 inches long, 1¾ inch in diameter and 8 ounces capacity. The cylinder is of seamless brass tubing and a ground brass piston is used. For oil use the piston is moved back and forward by the T handle, and the oil nozzle shown in the illustration is used. For grease the hand wheel is turned, which moves the piston through a rack and pinion arrangement which is easily operated.

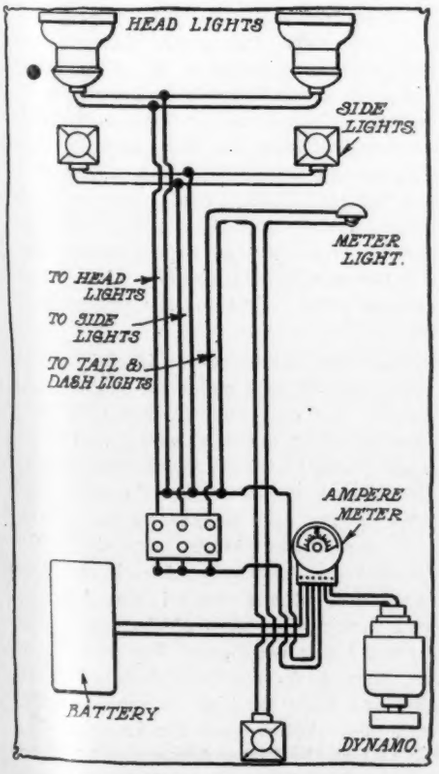


FIG. 6—ELBA WIRING DIAGRAM

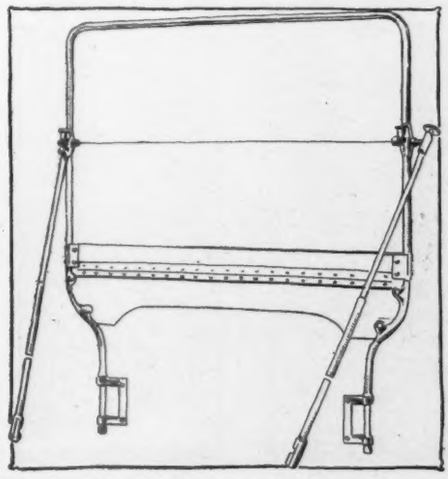


FIG. 7—BANKER WINDSHIELD

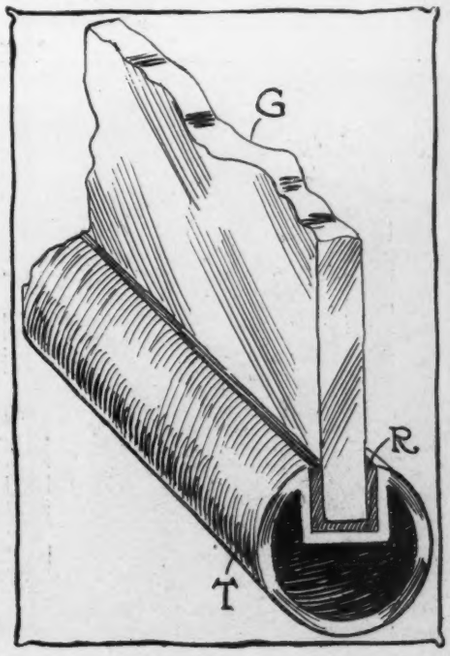


FIG. 8—BANKER WINDSHIELD CONSTRUCTION

Among the Makers and Dealers

Stoddard Agent Moves—The McDuffee Automobile Co., of Chicago, agent for the Stoddard-Dayton, has moved into its new $100,000 building at Michigan avenue and Twenty-fifth street.

New Warner Branch—The Warner Instrument Co. has opened another branch office at Kansas City, at 1613 Grand avenue. It will be in charge of H. A. Reifenberg, formerly of the Detroit branch.

Hilliard Becomes Aviator—William Hilliard, the well-known race driver, has resigned as manager of the Boston branch of the Hol Tan company. He is succeeded by George D. Bary, who was associated with him at the branch. Mr. Hilliard is going to turn his attention to aeroplanes.

New Plant for Bosch—Papers have gone to record by which 7 acres of land on the outskirts of Springfield, Mass., have been sold to the Bosch Magneto Co. On this land will be erected what the magneto firm states will be the finest plant of its kind in America. By the time it is well under way work will be started on the other buildings, which will be model factories.

Taximeter Merger—The Franco-American Taximeter Co. and the Jones Taximeter Co. have merged interests and the combine will be operated under the name of the American Taximeter Co. To the new company all the patents of these hitherto competing companies have been transfered so that in the future users of both Popp taximeters and the Jones instruments may have no fear of suits for infringement. The uniting companies retain an equal representation on the board of directors, Francois Ducasse acting as president and general manager and Joseph W. Jones vice-president. The new company's principal offices and garage will be located at 736-739 Seventh avenue, New York.

Building Big Annex—E. D. Crane & Co., of Atlanta, Ga., is constructing a motor car annex in the rear of their present location at 44-46 Madison avenue. The garage will be 50 by 125 feet and of stone and concrete construction. The concern represents the Columbus electric, Firestone-Columbus and Hupmobile.

Also Studebaker Directors—As a result of the merging of the interests of the Studebaker Brothers Mfg. Co. and the E-M-F Co., a meeting of the board of directors of the Studebaker Brothers Mfg. Co. was held at the offices of the company in South Bend and at the invitation of the management Walter E. Flanders, the president and general manager of the E-M-F Co., and Frederick W. Stevens, of J. P. Morgan & Co., of New York, were elected members of the board of directors of Studebaker company. Both are now members of the board of directors of the E-M-F Co., of Detroit.

Building Big Forge Plant—The Anderson Forge and Machine Co., of Detroit, is building a large drop forging plant in the Fairview district which will include nine buildings, the total cost of which will be $750,000. All but one of the nine buildings will be of concrete and there will be a complete system of industrial tracks to handle the raw materials for all departments and carry the finished product to the inspection and shipping rooms. In the die-making department all the heavier machines will be individual motor drive. The boilers will be of the water tube type carrying 200 pounds of pressure, and oil will be used for fuel throughout the plant. In addition to the forging equipment the company will install a complete heat-treating department equipped with a system of oil baths and furnaces, all connected with pyrometers.

Garage of Keck-Gommerman Co., of Mt. Vernon, Ind.

Kilgore Opens Branch—The Kilgore Mfg. Co. is branching out. The company has leased for a number of years several rooms in the Automobile building, Broadway, New York, where it will open a branch. It has also appointed George E. Loveland its Pennsylvania representative with headquarters at Harrisburg.

Organization Completed—The organization of the Lauth-Jeurgens Motor Car Co., a $150,000 corporation, was completed at a meeting of stockholders held at Fremont, O., last Saturday. The following officers were elected: President, J. W. Worst; vice-president and general manager, Theo. Jeurgens; secretary, R. C. Travers; treasurer, J. W. Pero; assistant secretary and treasurer, Joseph Binsac.

Castle Buys Land—The Castle Lamp Co., of Amesbury, Mass., which contemplates moving to Toledo, purchased 7 acres of land, located at Auburn avenue and West Bancroft street in Toledo. The company will at once begin the erection of its buildings, which are to cost $100,000. The plant will give employment to 700 men and the present factory at Amesbury will be removed to Toledo as soon as the buildings can be erected here and the machinery installed.

Great Western Testing Track — The Great Western Automobile Co., of Peru, Ind., has constructed a ½ mile testing track on the company's property for the testing of its chassis. The track is so constructed that the test cars have to pull through very heavy muck, which gives the car an excellent trial. The final run then is made on the country roads for high speed. This gives an oportunity of testing the cars out thoroughly with only a portion of the time on the public highway.

Music for Workmen—It is claimed the only employes of a motor car factory, and possibly the only ones in any kind of a manufacturing establishment, who have music during their noon lunches are those of the Pierce-Arrow Motor Car Co. at Buffalo. Recently the men, backed by the officers and department heads, organized the Pierce-Arrow Amusement Association. This association stands behind the baseball team bearing the name of the car, all the players being employes. The association also plans to have entertainments for the men and their families at regular intervals. For that purpose the immense dining hall at the Pierce-Arrow plant will be used. In this hall 800 men are served with

lunch at noon, and a short time ago decided to have music with their meals. Accordingly a grand piano was bought and a man to play it engaged.

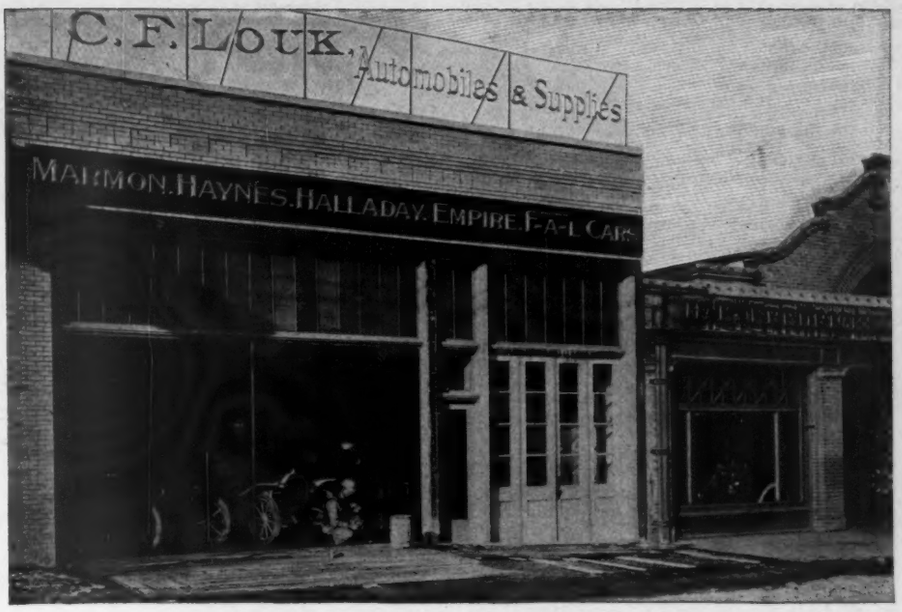
Parry Branch Moves—The Parry agency in Boston has moved to more commodious quarters in the motor mart in Park square, from the place it occupied further along on Columbus avenue. W. A. Webber, who had charge of the agency has resigned, and there will be a new manager installed in a few days.

Tube Prices Increased—The Empire Tire Co. announces that the rubber market has advanced to such a point that it finds it imperative to make an advance in price on certain of the goods it manufactures. Of chief interest is the announcement of a 30 per cent increase in the list on Empire Peerless red inner tubes.

Ohio Incorporations—The M. & M. Co., of Cleveland, was incorporated recently with a capital stock of $15,000 by C. S. Machner, R. A. Wilbur, J. C. McLean, A. S. Dole and F. B. Graham, to deal in parts. The Lebanon Auto and Storage Co., of Lebanon, O., was incorporated with a capital of $25,000 by George B. Johnson and others.

Goodrich Paris Branch Moves—Hampered by the growth of business the Paris tire branch of the Goodrich company has been obliged to seek larger premises and has been successful in securing an advantageous location in a building about to be vacated by the Peugeot company. The new premises form a corner block facing into the center of the Avenue de la Grande Armee, the motor row of Paris. Manager Augier states that he will retain the old premises as stock rooms.

Motor Boom in Boston—The boom for the motor industry in Boston continues. Deals are under way now for the erecting of additional new buildings on Boylston street for motor car dealers and accessory men, but the final papers have not yet gone to record. The Thomas branch is to have a new home. It has been stated on good authority that a new home for the Diamond Rubber Co. is projected on this same street and that the Fisk people have closed a deal for property for like purposes. A prominent real estate man said that there were at least three other firms looking over the sites along Boylston street also.



GARAGE AND SALESROOM OF C. F. LOUCK OF OMAHA

Wrong Caption—On page 105, advertising section Motor Age, March 17, the caption "Grabowsky Truck, Built for Washburn-Crosby Co., Minneapolis, Minn.," appeared. It should have read the "truck built for F. C. Jenkins & Co., flour dealer, Pittsburg, Pa."

Padgett Wins Suit—J. M. Padgett, of Topeka, Kan., announces that he has won the suit brought against Lewis E. Rice, of Cedar Falls, Ia., for an infringement of Mr. Padgett's Stitch-in-Time vulcanizer patent. This device is a portable vulcanizer for mending tires. It is carried in the tool kit and is said to repair a cut in the casing without deflating the tires.

Michelin Wins Lawsuit—A lawsuit pending for more than a year between Michelin & Co., of France, and the Austrian Continental Co., regarding the ownership and use of the trade-mark Semelle to designate an anti-skid pneumatic tire, has just been decided in favor of the Michelin company, it is announced by the latter concern. The minister of public works of Austria states in his decision that the word "Semelle," so universally used by Michelin to designate its anti-skid tire, is an acceptable trade-mark and that Michelin be accorded exclusive use of same.

Lazarnick Glidden Photographer—N. Lazarnick, the New York photographer, who has done the official pictorial work in connection with laying out the route for nearly all the Glidden tours of recent years, has received the appointment as official photographer to accompany the Chalmers pathfinder on its trip over the route chosen for the 1910 Glidden. The tour does not start till June, but the Chalmers pathfinder will start early in April to pick the way down into Texas and back by a different route.

Dayton Again Columbia Man—The Columbia Motor Car Co., of Hartford, Conn., has added to its force F. E. Dayton, who will assume charge of the sales organization of the Columbia concern April 1. The Columbia line is well known to Mr. Dayton, as he was connected with this concern for 5 years when it was known as the Electric Vehicle Co., acting at different times in the capacity of salesman and branch house manager at Boston and Chicago. For the past 2 years Mr. Dayton has been sales manager of the New York plant of Rogers & Co.

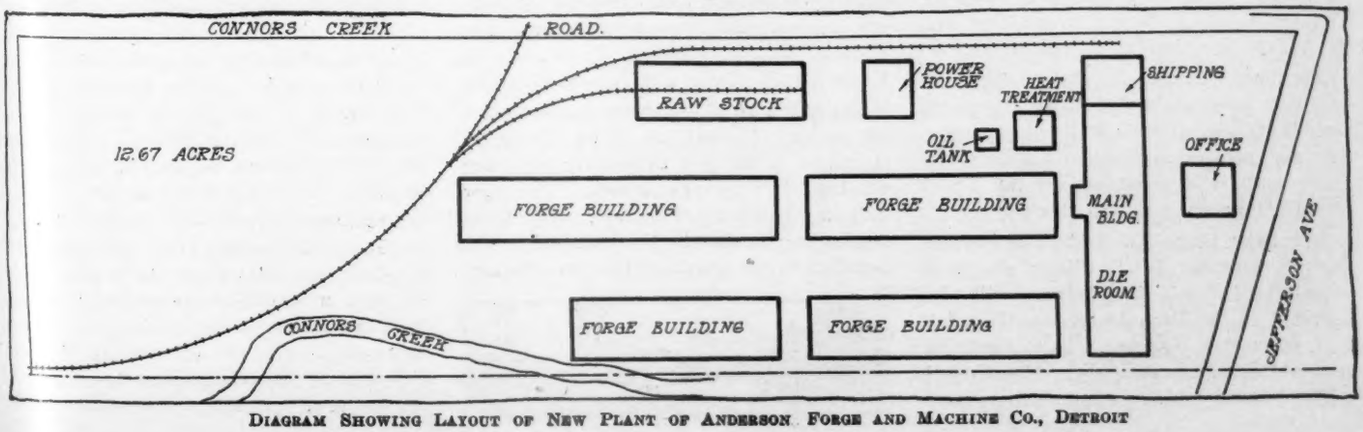


DIAGRAM SHOWING LAYOUT OF NEW PLANT OF ANDERSON FORGE AND MACHINE CO., DETROIT

Recent Incorporations

Houston, Tex.—Standard Auto Co., capital stock $15,000; incorporators, G. F. Colton, Ike Keller, M. E. E. Guthrie.

New Orleans, La.—Fairchild Auto Co., capital stock $100,000, to manufacture, buy, sell, repair and rent motor cars and all kinds of vehicles; incorporators, L. H. Fairchild, E. H. Fairchild, S. J. White and F. C. Bowlus, of New Orleans.

Buffalo, N. Y.—Auto Battery and Electrical Co., capital stock $20,000, to manufacture electrical devices and appliances for motor cars; incorporators, T. P. Meinhard, C. B. Bleyler and Montford Ryan.

Buffalo, N. Y.—Federal Motor Car Co., capital stock $100,000, to manufacture machines to generate gas or electricity; incorporators, H. A. Dann of Lancaster, W. C. Barker and T. C. Coons.

Lockport, N. Y.—Murlehof Mfg. Co., capital stock $3,000, to manufacture motor accessories; incorporators, Claude E. Murphy, Clarence E. Koffman and A. Edmund Lee.

New York.—Gus Balzer Co., capital stock $25,000, to manufacture and deal in and repair motor vehicles; incorporators, G. Balzer, C. S. Zimmerman, C. H. Miller, of New York City.

Syracuse, N. Y.—Syracuse Auto School, capital stock $10,000, to teach driving, selling, repairing, etc., manufacture and deal in all kinds of vehicles; incorporators, Vera Fuerth, Joe J. Fuerth and George C. Davey.

Buffalo, N. Y.—Niagara Gasoline Motor Co., capital stock $50,000, to manufacture motor engines, supplies, etc.; incorporators, Charles Jempsen, Morris M. Hadden, Daniel M. Billington.

Canastota, N. Y.—Tuttle Motor Co., capital stock $150,000, to manufacture gas engines, motor cars, motor boats, etc.; incorporators, S. E. Brown, J. S. Munroe and D. M. Tuttle.

New York.—Gyrex Mfg. Co., capital stock $25,000, to manufacture and deal in engines, motors, motor boats, motor cars, aeroplanes, etc.; incorporators, E. H. Stickles, C. A. Wardle and H. W. Webb.

Brief Business

Bradford, Pa.—The Bradford Garage Co. has been incorporated with a capital of $8,500.

Fresno, Cal.—The Evans-Beall Auto Co. will open a new garage at K and Merced streets, where it will handle the Dorris.

Erie, Pa.—A permit has been granted to Fred Densmore for a two-story brick garage on Sixteenth and State streets, to cost $5,000.

Washington, D. C.—The Studebaker Automobile Co. has opened a branch at 1313 New York avenue. It will be managed by Leonard P. Dorsett, formerly of the L. P. Dorsett Co.

Pittsburg, Pa—The Consumers' Auto Supply Co. is now located at 412 Diamond street, near the center of the downtown district. It has the largest showrooms of any supply company in Pittsburg.

Tampa, Fla.—A garage company has been organized in De Land with a capital of $15,000 to build a garage of concrete and brick. D. J. Miller is president and W. W. Gould secretary and treasurer.

Negaunee, Mich.—D. D. Smith, the Mitchell company's agent in Marquette and Delta counties, is fitting up a garage and repair shop in the building formerly used as a warehouse by the Upper Peninsula Brewing Co., in this city.

Salt Lake City, Utah—The Utah Motor Car Co. and the L. J. Gilmer Co. have consolidated and in future will be operated as the Utah Motor Car Co., with I. J. Gilmer as manager. D. C. Jackling is president of the company. About April 1 the company will move into new quarters in State street. The company handles the Packard, American, Cadillac and Detroit electric.

Vernon, N. Y.—Dr. G. M. Lewis is building a cement block garage on Peterboro street.

Johnstown, Pa.—The Park Automobile Co. has been formed by F. J. and E. L. Erwin and Bruce H. Campbell.

Lexington, Ky.—The Hobson Automobile Co. has been formed by Dr. Hobson, of Richmond, and opened at 123 East Short street.

New York—The J. E. Demar Co., manufacturer of bodies and tops, has leased a six-story and basement garage, 50 by 100, at 304-306 West Forty-ninth street.

Pittsburg, Pa.—G. A. Schnabel & Sons, who have been building wagons for three generations, have turned their attention to the manufacture of motor car bodies.

Pittsburg, Pa—A new concern in Pittsburg is the Mutual Mfg. Co., composed of George Ferrer, A. J. Kraber and E. R. Cramer. It will manufacture windshields.

Pittsburg, Pa.—Bids are being received by Milligan & Miller for the construction of a garage on Baum street for the McAllister Motor Car Co. to cost $25,000.

Omaha, Neb.—The Ford Motor Co. has awarded a contract for the erection of a brick garage at Twentieth and Harney streets. The building will be 66 by 148 feet and will cost $40,000.

Homestead, Pa.—The Homestead Automobile Co. is building a large garage at 209 Seventh avenue, Pa., and will have the agency for the Rambler and Franklin. M. W. Coulter will be president and manager.

Johnstown, Pa.—The Park Automobile Co. has made application for a charter to manufacture, buy, sell, lease, repair and deal in motor cars. F. J. Irwin, E. L. Irwin and Bruce H. Campbell are interested.

Cincinnati, O.—The James Kidney Motor Truck Co. has been incorporated with a capital stock of $10,000 to manufacture motor cars, motor trucks and delivery wagons. The incorporators are James Kidney, W. W. Ramsey, W. A. Stuart, Frederick E. Clark and Joseph Wilshore.

Rochester, N. Y.—Thomas J. Northway, at present located at 92-94 Exchange street, is building a three-story structure at 100-2-4 Exchange street. The new building is 54 by 140 feet, with three stories in addition to the basement. Mr. Northway will continue the manufacture of his line of motor specialties, including adjustable lamp brackets and large steering wheels.

Atlanta, Ga.—The Atlanta B. & I. Co. is building a stone garage at 55 West Mitchell street.

Vancouver, B. C.—Frank Wilcox will shortly occupy the new garage on Seventh and Washington streets.

Zanesville, O.—The Electric Auto Horn Co. has been incorporated with a capital of $10,000 to manufacture a motor horn.

Washington, D. C.—Charles E. Myers, agent for the Elmore, has secured a permit to erect a salesroom and garage at 1429 L street, N. W.

Hartford, Wis.—Walters & Wittig, machinists at Hartford, Wis., have purchased a site for a large garage building which they intend to operate.

Topeka, Kan.—Longren & Tulien have taken over the interests of Campbell & Robbins and will handle the Oldsmobile, Oakland and Reliance.

Columbus, O.—The announcement is made by the Goodrich company, of Akron, that it is in need of 200 girls. A separate employment bureau for girls has been established.

Uniontown, Pa.—The Central garage on South Gallitzin avenue has been completed. P. W. Newell is president of the company and A. E. Corns is secretary and treasurer. It will have the Elmore agency.

New Castle, Pa—R. H. Orr of Mercer, Pa., has bought the Oldsmobile agency from Alpha M. Brown and has located on South Mercer street. He also will handle the Oakland in New Castle and continue to handle the Oldsmobile at Mercer, Pa.

Streator, Ill.—The Racine-Sattley Co. has contracted for the Halladay line for central and northern Iowa. E. A. Kizer, formerly with Cruzan & Co., of Des Moines, has accepted a position as sales manager of the motor car department, and will devote his entire time and efforts to this line.

Galion, O.—At a meeting of the stockholders of the Howard Motor Car Co., recently the following were elected on the board of directors; Adam Howard, H. A. Pounder, W. J. Geer, H. Gottdiener, B. B. Gill, Frank Faber and Fred K. Beery. The site for the factory, which will be located at Galion, will be selected soon.

Washington, D. C.—E. A. Garlock has purchased the garage and repair shop of the Overland Sales Co., 1214 V street, N. W., and will utilize the entire building for storage and repairs, adding a charging station and a full line of supplies. It will be known as the Overland garage and will be managed by Frank R. Chase. The

Announcements

Overland agency will be continued by F. R. Conrad, who will open a salesroom in the downtown section.

Elizabeth, N. J.—The Sterling Garage and Automobile Co. has incorporated with a capital stock of $5,000.

Utica, N. Y.—The Westcott Garage Co. is building another story to the garage on Cornelia and Columbia streets.

Omaha, Neb.—F. C. Johnson, who has been with the C. F. Louck Co. for the past year, is now with the Ford Motor Co.

Brooklyn, N. Y.—The Kirkham Garage, 1060 Bedford avenue, has completed its new addition, making 75 by 50 floor space.

Pittsburg, Pa.—The Central Automobile Co. has leased the garage at 6112 Broad street, East End, for a general distributing station.

Utica, N. Y.—The Oneida Garage Co., after April 1, will be known as the Genesee Garage Co., of which W. E. Johnson will be manager.

Poughkeepsie, N. Y.—Ryder's new garage is being completed on Market street and in the meantime he is in a temporary garage in Catherine street.

New Kensington, Pa—The New Kensington Motor Co. has been chartered by J. W. Vernam of that place, J. E. McKee of Ambridge, Pa., and J. G. Silvena of Homestead, Pa.

Portland, Ore.—A three-story garage covering property 100 by 100, is soon to be erected at East Burnside and Grand avenue, which when completed will be occupied jointly by C. M. Parker and Harry Twitchell.

Racine, Wis.—The Kelly-Racine Rubber Co. has been licensed as a corporation in Wisconsin. The capital stock is $500,000. Martin J. Gillen, M. J. Knobloch and Mary E. Lunn appear as the incorporators. The headquarters are at Racine, Wis.

Galveston, Tex.—L. E. Perry has been appointed to take charge of the Buick agency and garage in Galveston. The garage is a building on Market street, which has been remodeled, concrete flooring put in, and a complete repair shop installed.

Columbus, O.—The Toledo Regal Sales Co., of Toledo, O., was incorporated recently with a capital stock of $5,000 to act as agent for the Regal in Northwestern Ohio. The incorporators were William S. MacMurray, H. J. Chittenden, A. L. Trautmeier, William Rather and Charles Rather.

Columbus, O.—The Barndt-Johnston Auto Supply Co., which recently increased its capital stock from $50,000 to $150,000, has closed a deal for a large plant located in South Columbus. The plant was formerly used by the Columbus Woodenware Co. and will be remodeled to suit the purposes of the supply company. Included in the purchase are 5 acres of land to permit of enlargements.

East Orange, N. J.—Harris S. Gonzales has secured a permit for the erection of a concrete garage.

Kent, O.—Cliff Garrison and Peter Young have opened a motor livery with several cars as a start.

Dodgeville, Wis.—J. H. Ford has opened a garage and salesroom at Dodgeville, Wis. He will distribute the Studebaker line.

Montgomery, Ala.—The Deere Implement Co. is opening a motor car department in its spacious warehouse on lower Commerce street.

Buffalo, N. Y.—A new garage and repair shop has been opened by the United States Auto Station at 1114 Main street. The manager is H. W. Senton.

Kansas City, Mo.—The Rambler Automobile Co. and C. A. Post, distributor of Kisselkars has moved to new quarters, 924-930 East Fifteenth street.

Salem, Mass.—Zina Goodell is building a garage on Lafayette street, 60 by 145, to accommodate about 100 cars. It is of reinforced concrete and is to be ready June 1.

Philadelphia, Pa.—The Penn Auto Supply Co., John W. Lee, president, has opened a new branch at 1407 Filbert street, just opposite the city hall and Broad street station.

Indianapolis, Ind.—The Overland Automobile Co. has secured a permit for the erection of a one-story concrete factory building at Fifteenth street and the Big Four railroad tracks, to cost $10,938.

Allenton, Wis.—Articles of incorporation have been filed and a charter granted to the Washington County Automobile Co., of Allenton, Washington county, Wis. The capital stock is $10,000, and M. H. Smith is the leading stockholder.

Beloit, Wis.—Irving H. Manning, recently with the American Locomotive Co., has joined the selling force of the Warner Instrument Co. Mr. Manning becomes special representative for the Warner Instrument Co. and will not confine himself to any one branch.

Detroit, Mich.—Kenneth R. Montgomery, formerly connected with the Packard Motor Car Co., and M. E. Geer, a Pittsburg banker, have formed the Montgomery Auto Sales Co., with temporary offices at 467-469 Woodward avenue. They have the agency for the American car and the

New Agencies Appointed

Brooklyn, N. Y.—Enterprise Garage Co., Auburn.
Altoona, Pa.—Moser & Lampe, Franklin.
Birmingham, Ala.—Birmingham Buggy Co., Firestone-Columbus.
Detroit, Mich.—W. S. Sumner, Empire.
Uniontown, Pa.—Central Garage, Elmore.
Homestead, Pa.—Homestead Automobile Co., Rambler and Franklin.
Louisville, Ky—Reimers Motor Car Co., Babcock electric.
Pittsburg, Pa.—Forbes Motor Car Co., Abbott-Detroit and Krit.
Altoona, Pa.—Mozer & Lamp, Franklin.
Chicago—Federal Motor Car Co., Ideal electric.
Itta Bena, Miss.—Davis-Bell Hardware Co., Maxwell.
Nebraska City, Neb.—R. A. Duff, Hupmobile.
Toledo, O.—E. F. Lienhard, Paterson.
San Antonio, Tex.—Erkel Automobile Co., Jackson.
Fort Worth, Tex.—Wortham-Shotts Co., Jackson.
Houston, Tex.—McKallif & Abbey, Jackson.
Nashville, Tenn.—E. E. Houk, Jackson.
Pine Bluff, Ark.—Trimble Auto Co., Jackson.
Birmingham, Ala.—Cooper Automobile Co., Jackson.
Tampa, Fla.—C. F. Irsch, Jackson.
Ocala, Fla.—McIver & McKay, Jackson.
Republic, Mo.—E. L. Beal, Jackson.
East St. Louis, Ill.—East St. Louis Automobile Co., Jackson.
Lexington, Ky.—Bayless Motor Car Co., Jackson.
Montgomery, Ala.—Deere Implement and Vehicle Co., Jackson.
Des Moines, Ia.—Cruzan & Co., R. A. C.
St. Louis, Mo.—Charles Sonneman, R. A. C.
Minneapolis, Minn.—I. C. Speers, Maytag.

Speedwell. The company will build a garage of its own further out Woodward avenue in the near future.

Topeka, Kan.—The White Garage Co, which was formerly at 928 Kansas avenue is located at 108 East Tenth street.

Tacoma, Wash.—The Tacoma Auto Livery Co. has been incorporated by Herbert Howard, George Schaler and L. K. McBreen.

Seattle, Wash.—The Auto Supply and Exchange, capital stock $10,000, has been formed by J. C. Hayward, R. W. Theobald and Thomas Coppin.

Oshkosh, Wis.—The Punctureless Tire Co., of Oshkosh, Wis., has been granted a charter by the state of Wisconsin. The capital stock is $50,000 and the incorporators are: H. D. Weed, C. W. G. Everhart and Elrich Anderson.

Pittsburg, Pa.—The Packers' Motor Truck Co., capital $100,000, has been formed here by William Zoller and E. K. Callahan, of Pittsburg; Albert M. Schenk, of Wheeling, W. Va.; James F. McGarry, of East Liverpool, O., and George P. Pratt, of Buffalo, N. Y. The company will manufacture 1, 2 and 3-ton trucks and will locate a factory in Pittsburg soon.

Salt Lake City, Utah—A motor stage service will be put in operation between this city and Brighton, as soon as the resort season opens. The Utah Motor Co. is arranging to make the round trip twice daily. There is no more beautiful canyon in all the West than Big Cottonwood, and tourists declare that Europe offers few beauty spots that can compare with it.

COPPER-ALUMINUM ALLOYS WITH MANGANESE

PART III

EDITOR'S NOTE—The following is the third installment of the ninth report of the alloys research committee of the Institution of Mechanical Engineers of Great Britain, which report was presented in full during the session, January, 1910. The authors of this report are Dr. W. Rosenhain and F. C. H. A. Lantsberry, of the National Physical Laboratory, Tellington, Eng.

TABLE 2

Tensile Tests on Sand Castings of Exploratory Heats

No.	Composition per cent Al.	Mn.	Yield-Point Tons per sq. in.	Ultimate Stress Tons per sq. in.	Elastic Ratio	Elongation on 2 inches per cent.
00	9.61	....	11.00	33.62	0.33	40.0
01	9.86	0.93	10.84	32.35	0.34	21.0
02	9.06	0.90	12.00	29.92*	0.40	45.0*
03	10.97	1.91	18.61	32.80*	0.57	3.25
04	10.41	1.91	17.60	24.64	0.72	6.0
05	10.18	1.74	12.64	33.16	0.38	16.0
06	9.46	1.80	10.88	32.72	0.33	28.0
07	9.35	1.92	11.84	31.02	0.38	27.0
08	9.55	2.89	11.02	34.98	0.31	21.0
09	8.08	3.12	10.87	29.67	0.37	47.0
010	7.51	2.79	8.30	20.29	0.41	39.0
011	3.93	2.99	7.14	13.68	0.52	18.0†
012	9.48	3.77	13.80	34.76	0.40	14.0†
013	7.75	4.02	11.26	28.90	0.39	47.5
014	6.99	3.74	9.10	20.44	0.46	29.0†
015	9.71	4.74	14.74	38.03*	0.39	9.0
016	8.56	4.77	12.23	29.45	0.42	18.0
017	7.25	4.99	9.92	24.26	0.41	50.0
018	7.36	5.75	11.92	28.00*	0.43	39.0*
019	8.07	7.08	15.38	28.47	0.54	15.0
020	4.26	5.74	7.52	13.92	0.54	20.0
021	4.12	9.60	8.72	13.66	0.64	16.5

* Specimens marked with a * gave duplicate results differing by more than two tons. The figure given in the table is in every case the highest obtained, since the lower figures were due to small defects in the castings, while the higher figures were in many instances confirmed by later tests on the same alloy made in larger quantities.

† Specimens marked with the † broke outside the gauge marks.

BEFORE turning to the detailed study of these selected alloys the results of the exploratory heats may be examined from another point of view. The diagrams already given represent the alloys from the point of view of the effect of manganese on a series of alloys containing a certain constant proportion of aluminum. The diagrams of Fig. 10 and Fig. 11 refer to a group of alloys lying along the line of 3 per cent manganese and show the influence of increasing proportions of aluminum. The points available for these curves are not perhaps sufficiently numerous to allow any very wide conclusions to be drawn, but the general shape of the curves is consistent with the view that the effect of aluminum on these copper-manganese alloys is very similar to its effect on pure copper, resulting in tenacity increasing to a maximum, with ductility decreasing rapidly after a certain concentration has been attained, but it would appear that the positions of maximum tensile strength and maximum ductility have been considerably displaced as compared with their position in the copper-aluminum series. This displacement finds a natural explanation in the shape of the liquidous surface of the ternary system.

The diagrams of Figs. 12 and 13 finally refer to a group of alloys in which the proportion of copper present is constant, both aluminum and manganese being variable—these alloys lie on the line rs of Fig. 3. These diagrams are of interest chiefly from the point of view of the doctrine of the metallurgical equivalence of various metals in their relation to a third metal. Thus, if the effect of manganese on copper were quantitatively the same as that of aluminum, then all the curves of Figs. 12 and 13 would be horizontal straight lines; it will be seen at once that this is not the case, for while the sum of aluminum copper remains constant and equal to 10 per cent throughout this group of alloys, the tensile strength decreases along a curve which is not far from a straight line. This line is decidedly less steep than it would be in the total absence of manganese, so that even as regards tensile strength manganese does to a certain extent replace aluminum, but a given proportion of manganese produces a smaller effect in raising the tensile strength than that which results from an equal proportion of aluminum. On the other hand, as regards both yield-point and elongation the effect is somewhat different, as is indicated by the convex forms of the curves in Figs. 12 and 13. As regards elongation it appears from the initial upward tendency of the curves that the first replacement of aluminum by manganese leads to an increase of ductility, as would be anticipated from the corresponding reduction in ultimate stress, but subsequently the ductility falls in spite of falling tenacity—an effect which at once sets a limit to the utility of manganese as an addition to these alloys. The yield-point curve, however,. is more encouraging, for, in spite of lowered tenacity and increased ductility, the first effect of replacing aluminum by manganese appears to be a slight rise of the yield-point. This consideration lends special interest to the alloys selected for fuller study, since they lie near the region in which this advantageous effect makes itself felt.

TABLE 3

Tensile Tests on Chill Castings of Exploratory Heats

No.	Composition per cent. Al.	Mn.	Yield-Point Tons per sq. in.	Ultimate Stress Tons per sq. in.	Elastic Ratio	Elongation on 2 inches per cent.
01	9.86	0.93	13.52	38.25	0.35	31.0
02	9.06	0.90	13.20	33.64	0.39	44.0
03	10.97	1.91	18.32	40.28	0.45	7.5
04	10.41	1.91	‡	39.52	....	9.0†
05	10.18	1.74	18.00	40.32	0.45	18.0
06	9.46	1.80	15.60	37.40	0.42	30.0
07	9.35	1.92	13.56	30.54*	0.44	17.0
08	9.55	2.89	14.24	37.20	0.38	20.0
09	8.08	3.12	12.24	31.79	0.39	42.0
010	7.51	2.79	9.20	22.52	0.41	42.0
011	3.93	2.99	7.48	17.89	0.42	32.0
012	9.48	3.77	14.60	37.80	0.40	14.0†
013	7.75	4.02	13.00	32.00	0.41	47.5
014	6.99	3.74	9.20	24.15	0.38	35.5
015	9.71	4.74	15.04	35.84	0.42	7.5†
016	8.56	4.77	14.00	34.82	0.40	27.5
017	7.25	4.99	10.88	25.64	0.42	48.0
018	7.36	5.75	9.88	28.08	0.35	24.0
019	8.07	7.08	16.30	32.04	0.51	17.0
020	4.26	5.74	7.78	17.89	0.44	25.0
021	4.12	9.60	9.10	19.88	0.46	30.0

* This is an abnormally low figure, and may be attributed to a defective casting; a very similar alloy (No. 5 Large Heats) gave a normal result.

† These specimens broke outside the gauge marks.

‡ Not observed.

Fuller Study Selected Alloys

In accordance with the general conclusions arrived at from the results of the exploratory meltings, the authors proceeded to prepare larger heats of alloys whose composition was intended to approximate following percentages.

Number of Alloy..	1	2	3	4	5	6	7	8	9
Copper.	89.5	89.0	88.0	90.0	89.0	88.0	87.0	88.0	87.0
Aluminum.	10.0	10.0	10.0	9.0	9.0	9.0	9.0	8.0	8.0
Manganese.	0.5	1.0	2.0	1.0	2.0	3.0	4.0	4.0	5.0

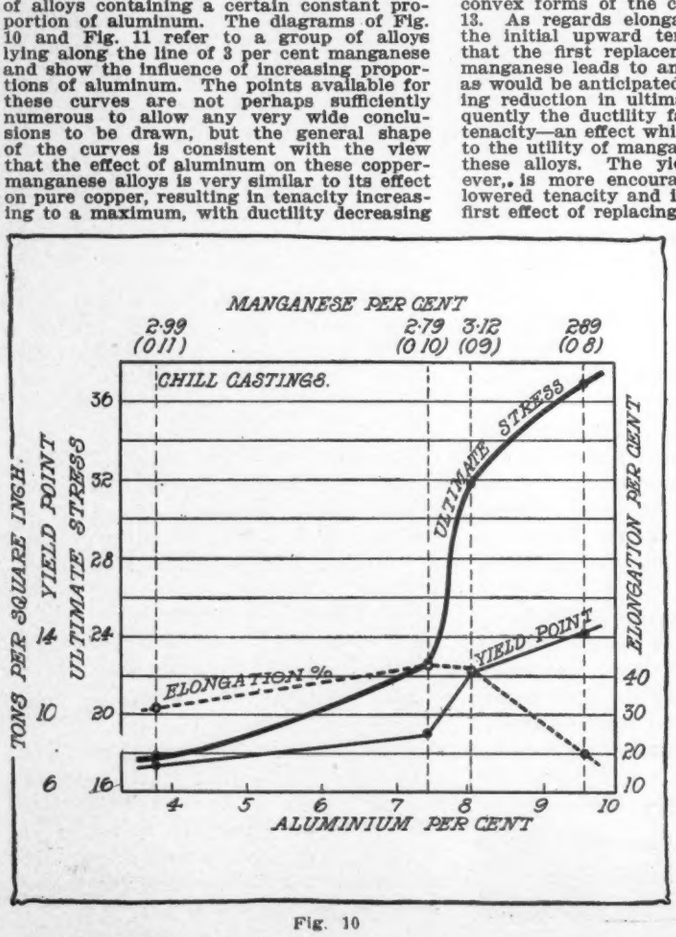


Fig. 10

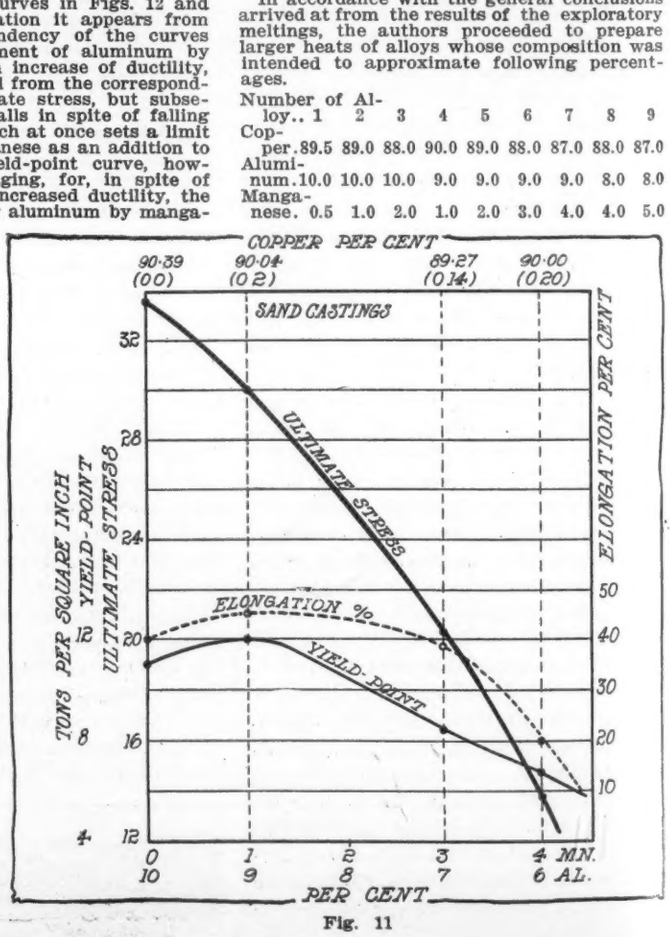


Fig. 11

TABLE 5

Tensile Tests on Sand Castings of Nine Selected Alloys

No.	Composition		Yield-Point	Ultimate Stress	Elastic Ratio	Elongation on 2 inches per cent
	Al.	Mn.	Tons per sq. in.	Tons per sq. in.		
1	10.03	0.43	14.28	32.80	0.44	24
2	10.02	0.92	14.00	35.76	0.39	22.5
3	9.99	2.01	13.20	34.44	0.38	24
4	9.16	0.93	11.20	30.68	0.37	46.5*
5	9.06	1.95	10.60	31.32	0.34	40*
6	8.91	2.98	10.80	31.60	0.34	24†
7	9.33	3.78	12.24	32.12	0.38	20
8	8.02	3.94	11.40	28.80*	0.40	31.5
9	7.92	4.92	11.24	28.00	0.40	30

* In the above table the results represent the better of two duplicate tests which agree closely (as regards ultimate stress within 1 ton per square inch) except in the cases marked * where there is a discrepancy in regard to elongation of about 13 per cent.

† This specimen broke outside the gauge marks, so that the recorded elongation is exclusive of the local extension at the fracture.

TABLE 4

No.	Weights used (ozs.)			Composition aimed at			Composition found by Analysis		
	Cu.	Al.	Cu.-Mn.	Cu.	Al.	Mn.	Cu.	Al.‡	Mn.
1	797	90	14*	89.5	10	0.5	89.54	10.03	0.43
2	869	105.5	43†	89	10	1	89.06	10.02	0.92
2a	840	98	31*	89	10	1	89.10	9.89	1.01
3	650	80	67†	88	10	2	88.3	9.82	1.88
3a	794	95.5	60*	88	10	2	88.00	9.99	2.01
4	625	65	31†	90	9	1	89.91	9.16	0.93
5	764	83.5	78†	89	9	2	88.99	9.06	1.95
6	756	87	122†	88	9	3	88.11	8.91	2.98
6a	758	85	86*	88	9	3	88.06	9.10	2.84
7	786	95.5	178.5†	87	9	4	86.89	9.33	3.78
8	792	80	123*	88	8	4	88.04	8.02	3.94
9	795	83	160*	87	8	5	87.16	7.92	4.92

* Cupro-Manganese containing 32.42 per cent manganese.

† Cupro-Manganese containing 23.76 per cent manganese.

‡ The values given in the table for aluminum are found by "difference"; in all cases the alloys contain small quantities of iron and silicon, which should be deducted from the figures given for aluminum. In certain alloys the content of iron and silicon has been determined, as follows:

No. 2, iron 0.01 per cent and silicon 0.01 per cent.

No. 3, iron 0.03 per cent and silicon 0.34 per cent.

No. 6, iron 0.02 per cent and silicon 0.02 per cent.

TABLE 6

Tensile Tests on Chill Castings of Nine Selected Alloys

No.	Composition		Yield-Point	Ultimate Stress	Elastic Ratio	Elongation on 2 inches per cent
	Al.	Mn.	Tons per sq. in.	Tons per sq. in.		
1	10.03	0.43	15.92	36.00	0.44	24
2	10.02	0.92	16.00	39.90	0.40	25
3a	9.99	2.01	16.80	37.00	0.47	25
4	9.16	0.93	13.00	33.92	0.38	46
5	9.06	1.95	14.16	33.20	0.43	30
6	8.91	2.98	14.80	34.40	0.43	26
7	9.33	3.78	15.14	39.58	0.39	32
8	8.02	3.94	13.20	33.04	0.40	50
9	7.92	4.92	12.38	30.40	0.41	28

These figures represent the better of two duplicate tests which agree closely (as regards ultimate stress within 1.2 tons per square inch).

As the analyses of the alloys made in the exploratory heats had shown some little divergences in composition from that which had been aimed at in each case, and as the experience gained in the preparation of these smaller quantities of alloy indicated that the cause of these discrepancies most probably lay in the prolonged heating required to effect the dissolution of the metallic manganese in the copper, it was decided to endeavor to obviate this cause of uncertainty by the preliminary preparation of a cupro-manganese alloy which could then be used for the preparation of the ternary alloys.

Preparation of Cupro-Maganese

For this purpose a charge of 37.5 pounds of electrolytic ingot copper was melted down under a layer of wood charcoal, borax slag, saturated with oxide of manganese, being subsequently added so as to cover the molten metal. Thirteen pounds of thermite manganese were then added and the whole melted down and well stirred with a graphite rod. The slag was then poured off and the metal cast, partly into small chill molds and partly into water for the purpose of granulation. An analysis of the resulting alloy showed:

Copper .....75.74 per cent
Manganese .....23.76 per cent
Impurities—difference .. 0.50 per cent

a result which shows that a considerable elimination of the impurities present in the manganese had taken place.

Subsequently a cupro-manganese alloy richer in manganese was prepared in a similar manner by melting down 40.5 pounds of copper with 22.25 pounds of thermite manganese, together with a small quantity—5.25 pounds—of the earlier cupro-manganese just described. The complete analysis of the resulting alloy showed:

Copper .....66.82 per cent
Manganese .....32.42 per cent
Aluminum ..... 0.39 per cent
Silicon ..... 0.20 per cent
Iron ..... 0.11 per cent

99.94 per cent

Here again a very considerable amount of refining had taken place. It was found that with the compositions aimed at in these experiments the yield of alloy was satisfactory; attempts to prepare cupro-manganese richer in manganese, such as 50 per cent, gave unsatisfactory results, as apparently a very high temperature is required to dissolve these higher proportions of manganese in molten copper. For all the alloys of the present series the 33 per cent cupro-manganese is, of course, sufficiently rich in the latter element.

Sand and Chill Castings of Large Heats

The results of tensile tests on sand and chill castings of the nine selected alloys are given in Tables 5 and 6, the compositions of the alloys being given, as found by analysis, in Table 4.

A comparison of the contents of Tables 5 and 6 with those relating to the corresponding properties of pure copper aluminum alloys shows the influence of manganese very clearly, and indicates the advantages which can be gained by its use. Thus in the Eighth Report the highest tensile strength of sand castings is that containing 9.90 per cent aluminum; this alloy shows an ultimate strength of 31.70 tons per square inch with a yield point of 11.3 tons and an elongation on 2 inches of 21.7 per cent. As compared with this we have in the present series Nos. 2 and 3 showing a decided increase in all these figures, while No. 4 shows approximately equal strength, but much greater ductility. The authors regard the rise of 3 tons in the yield point, without diminution of ductility, as representing an important advantage.

An increase in both yield point and maximum stress, without serious loss of ductility, is again shown by alloys Nos. 2 and 3. The figures for alloy No. 7 in the present series also appear remarkable in comparison with those of pure copper-aluminum alloys.

Reference has already been made to the fact that out of six sand castings four were cast to the shape of the test pieces, while two were cast in the form of solid cylinders approximately 1.12 inch in diameter. In a certain number of the alloys test pieces of both kinds have been used and the comparative data are given in Table 7. It will be seen that there is no systematic difference between the two sets of results, so that the laborious process of machining test pieces from solid cylinders was found to be unnecessary.

Rolled and Drawn Bars

The billets prepared in the manner described were rolled and drawn. After being surfaced in a lathe, the billets were first hot-rolled to a diameter of 1¼ inch in nine passes, followed by two passes through the

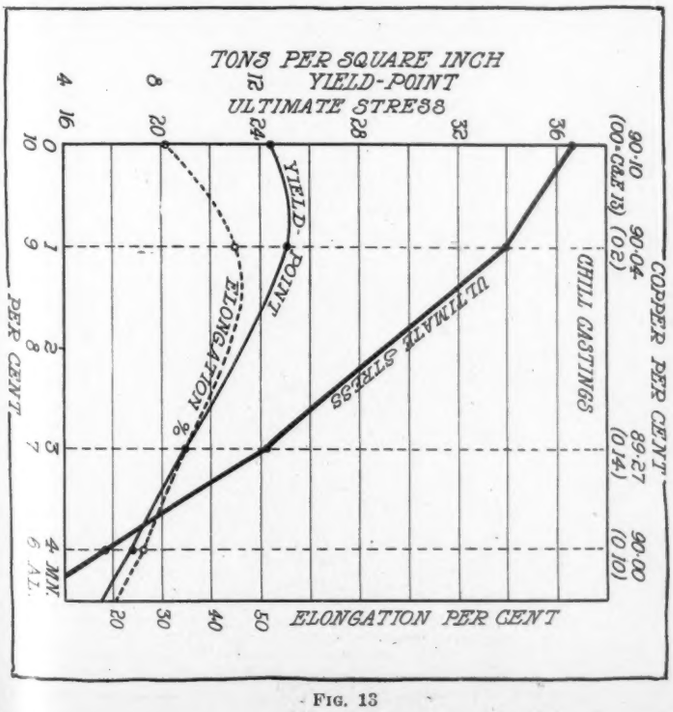


FIG. 13

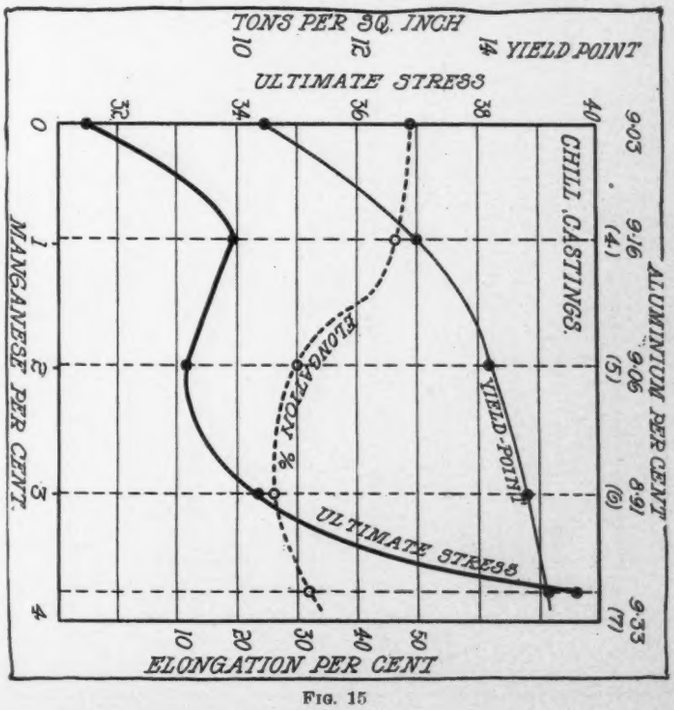


FIG. 15

TABLE 7

Comparison of Tensile Tests on Sand Castings of Selected Alloys Cast to Shape and Cast Solid

Composition				Yield Point	Ultimate Stress	Elastic Ratio	Elongation on 2 inches Per Cent
No.	Al.	Mn.	Casting	Tons per sq. in.	Tons per sq. in.		
2	10.02	0.92	Shaped	14.00	35.76	0.39	22.5
			Solid	13.20	34.30	0.39	24
3	9.99	2.01	Shaped	13.20	34.44	0.38	24
			Solid	13.28	32.00	0.41	24
5	9.06	1.95	Shaped	10.60	31.32	0.34	40
			Solid	10.80	31.44	0.34	33.6
6	8.91	2.98	Shaped	10.80	31.60	0.34	24
			Solid	10.88	30.92	0.35	27.6
7	9.33	3.78	Shaped	12.18	32.16*	0.38	20
			Solid	12.00	32.00	0.38	24.8
8	8.02	3.94	Shaped	11.40	28.80	0.40	31.5
			Solid	10.80	29.56	0.37	51

TABLE 8

Tensile Tests on Nine Selected Alloys in the Form of ¼-inch Rolled Bar

Composition			Yield Point	Ultimate Stress	Elastic Ratio	Elongation on 2 Inches Per Cent	Reduction of Area
No.	Al.	Mn.	Tons per sq. in.	Tons per sq. in.			
1	10.03	0.43	18.68	40.28	0.46	24.5*	*
2	10.02	0.92	17.12	38.08	0.46	26.5	32.4
3	9.82	1.88	18.20	40.40	0.45	35	31.3
4	9.16	0.93	16.28	36.28	0.45	45	46
5	9.06	1.95	16.80	37.12	0.45	43.5	47.2
6	8.91	2.28	18.04	38.64	0.47	43.5	46
7	9.33	3.78	16.80	38.12	0.44	34	38.4
8	8.02	3.94	16.32	35.60	0.46	49	56
9	7.92	4.92	17.60	36.24	0.49	52	54.8

*Both specimens broke outside the gauge marks.

The maximum variation between duplicates of the tests recorded in the above table was (as regards ultimate stress) 0.56 ton per square inch.

1¼-inch roll; the bars were then slowly cooled on the floor. Three-foot lengths were then cut off from each bar and hot-rolled in six passes to a diameter of 13-16 inch. From those bars whose length permitted it, further 2-foot lengths were cut off and first hot-rolled to a diameter of 15-16 inch, and were then cold drawn to ⅞ inch, annealed and finally cold drawn to 13-16 inch diameter. The remainder of the bars were kept at a diameter of 1⅛ inch for the purpose of tests in that condition.

It will be seen that, as the result of this treatment, material from each of the nine selected alloys was available in the form of:

1—Hot-rolled bars .....1¼ inch diameter
2—Hot-rolled bars.....13-16 inch diameter
3—Cold-drawn bars .....13-16 inch diameter

The material thus obtained was used for a series of further tests, and on the results of these three of the nine alloys were chosen for still more complete investigation.

The results of tensile tests, made in duplicate on standard 2-inch specimens, on each of the nine alloys in the three conditions named above are given in Tables 8, 9 and 10.

The results embodied in Tables 8, 9 and 10 require little comment. With regard to 1¼-inch rolled bars it will be seen that the strongest of the copper-aluminum series is No. 12, containing 9.38 per cent aluminum, and possessing an ultimate strength, in this conditon, of 37.3 tons, with a yield point of 14.8 tons and an elongation of 40 per cent on 2 inches. No. 5 of the present series, containing approximately 9 per cent of aluminum and 2 per cent of manganese, is very similar to this alloy in yield point and ultimate strength, but again shows a slightly better elongation. No. 6 of the present series, with a higher manganese content, is decidedly better, showing a decided increase in yield point and ultimate strength without any diminution of ductility. No. 3 of the present series, however, is the best in the condition now under review, with a yield point of over 18 tons and an ultimate strength of 40.4 tons, combined with an elongation of 35 per cent on 2 inches.

In the bars rolled to 13-16 inch, a very similar comparison holds good. The best of the alloys whose ductility lies above 20 per cent is again No. 13, whose maximum stress is 38.1 tons with an elongation of 28.8 per cent on 2 inches. Alloys No. 4 and 5 of the present series again lie very near this copper-aluminum alloy in respect of ultimate stress, but they show a very decided advantage in regard to both yield point and ductility, the former being 21.2 and 20.4 as against 14.8, and the elongation on 2 inches 41.5 and 42 as compared with 30.8. On the other hand, the alloy No. 2 of the present series exhibits a still higher yield point, 23 tons, and ultimate strength 42.8 tons, while the elongation, although less than in the three alloys just considered, is still well above the limit of 20 per cent. In general terms the authors consider that these results justify the conclusion that the effect of the addition of manganese in relatively small proportions to alloys of copper and aluminum rich in copper, is to stiffen the alloy, i. e., to increase both its yield point and its ultimate strength without reducing its ductility to a corresponding extent.

TABLE 9

Tensile Tests on Nine Selected Alloys in the Form of $\frac{13}{16}$-inch Rolled Bar

Composition			Yield Point	Ultimate Stress	Elastic Ratio	Elongation on 2 Inches Per Cent	Reduction of Area
No.	Al.	Mn.	Tons per sq. in.	Tons per sq. in.			
1	10.03	0.43	19.60	39.40	0.50	31	29.2
2	10.02	0.92	23.04	42.84	0.54	22.5	33.6
2a	9.87	1.01	18.50	41.75	0.44	30	....
3	....	....	21.40	40.72	0.53	29	32
3a	9.99	2.01	18.00	41.85	0.43	24	....
4	9.16	0.93	21.24	38.24	0.55	41.5	54
5	9.06	1.95	20.40	38.88	0.53	42	48
6	8.91	2.98	20.00	40.00	0.50	39	43.6
6a	9.10	2.84	19.20	41.20	0.47	40	....
7	2.33	3.78	18.12	40.52	0.45	35	38
8	8.02	3.94	18.72	37.44	0.50	45	54
9	7.92	4.92	19.32	36.60	0.53	45	51.2
0	....	....	6.32	15.00	0.42	52.5	70.6

The maximum variation between duplicates of the tests recorded in the above table was as regards ultimate stress 0.64 ton per square inch.

In connection with the comparison of the Tables 8 and 9 of the present report with Tables 23 and 24 of the Eighth Report, it is interesting to refer to a peculiarity of the alloy of copper and aluminum containing about 10 per cent of aluminum to which Messrs. Carpenter and Edwards direct special attention, viz., the fact that the mechanical properties of this alloy in the condition of a small chill casting are almost exactly the same as those of the same material after hot rolling. This peculiarity does not appear to be shared by the alloys of the present series, even in the case of those whose composition approximates most closely to that of the alloy containing 10 per cent of aluminum. This fact is readily seen when Tables 6 and 9 are compared; in every case there is a decided increase in ultimate strength, in some cases amounting to 6 tons per square inch, while there is also a marked rise in the yield point as the result of the rolling process.

The results of tests on cold-drawn bars are interesting as showing the extent to which the bars have been hardened by the particular mode of treatment to which they have been subjected. This degree of hardening may be gauged by the extension at fracture of the material in the cold-drawn condition. It will be seen at once that only the first three alloys of the present series have suffered any very considerable reduction of their ductility, the elongation on 2 inches of No. 3 particularly being reduced from 29 per cent to 10 per cent. On the other hand, the very high tensile strengths and high yield points of Nos. 2 and 3 are remarkable, being very considerably higher than anything attained by the alloys of copper and aluminum alone when treated in the same manner. See table 27 of the Eighth Report, where the highest ultimate strength shown is 44 tons. The alloys containing rather less aluminum and more manganese, i. e., Nos. 5 to 9 inclusive, are remarkable for the amount of ductility which they still display after undergoing cold drawing, being in this respect almost equal to commercial copper No. 0 in table 10, and markedly superior to the pure copper-aluminum alloys of lower aluminum content.

In order to provide a strictly comparable gauge of the severity of the rolling and drawing processes undergone by the bars whose tests are given in Tables 9 and 10, a bar of pure commercial copper was passed through the same treatment at the same time as the experimental bars, and the results of tensile tests made on the bars of copper thus treated are added to both the above tables, the material being numbered "0." The results obtained with this copper are approximately

TABLE 10

Tensile Tests on Nine Selected Alloys in the form of $\frac{13}{16}$-inch Cold-Drawn Bars

Composition			Yield Point	Ultimate Stress	Elastic Ratio	Elongation on 2 Inches Per Cent	Reduction of Area
No.	Al.	Mn.	Tons per sq. in.	Tons per sq. in.			Per Cent
1	10.03	0.43	42.04	46.20	0.91	13	18.8
2a	9.89	1.01	42.00	50.04	0.84	16	....
3a	9.99	2.01	40.88	52.08	0.79	10	....
5	9.06	1.95	36.88	42.32	0.87	23.5	40.8
6	8.91	2.98	38.92	44.00	0.91	22	40.8
7	9.33	3.78	40.70	43.70	0.93	21	34.0
8	8.02	3.94	34.80	39.60	0.88	35	55.2
9	7.92	4.92	34.80	41.20	0.84	30	49.2
0	0.	0.	16.72	17.48	0.96	35	60.8

The maximum variation between duplicates of the tests recorded in the above table was (as regards ultimate stress) 1.6 tons per square inch. In alloys Nos. 2a and 3a the variations were less than 0.2 ton per square inch.

TABLE 11

Hardness Numbers of Nine Selected Alloys

Composition			Load of 1,034 kg.		Load of 3,000 kg.		
No.	Al.	Mn.	Diameter of Indentation. mm.	Hardness No.	Diameter of Indentation.	Hardness No.	Scleroscope No.
1	10.03	0.43	3.19	170	4.93	199	27
2	10.02	0.92	3.31	158	5.03	190	27
3	9.82	1.88	3.25	164	4.99	193	27
4	9.16	0.93	3.44	146	5.29	171	23
5	9.06	1.95	3.22	165	5.10	184	24
6	8.91	2.98	3.30	158	5.06	187	25
7	9.33	3.78	3.23	165	5.05	186	25
8	8.02	3.94	3.29	159	5.28	170	22
9	7.92	4.92	3.42	149	5.27	169	22

those normally found with material which has been hot rolled and cold drawn respectively, and serve as a basis of comparison independent of the properties of other alloys which have been frequently employed as a basis of comparison in the present report.

This has been determined in the first instance by means of the Brinell ball test, carried out in precisely the same manner as the tests described on pages 183-186 of the Eighth Report. The specimens were cylindrical in shape, cut from the bars hot rolled to 1¼ inches diameter, and cut to a thickness of 25 mm. The indentations were made with a hardened steel ball 9.52 mm. in diameter, which was found to be unchanged when remeasured after the tests had been made. The specimens had polished surfaces and the indentations were measured with a micrometer microscope, suitable lighting arrangements being employed to render the edges of the indentations clearly visible. Indentations were made under loads of 1 ton (1,034 kg.) and 3,000 kg. respectively, the latter being the standard load for this test. The hardness numbers were calculated from the formula of Benedicks, viz.:

$$\text{Hardness number} = \frac{\text{Load (in kg.)}}{\text{Superficies of cavity in mm}^2} \times {}^5\sqrt{\rho}$$

The superficies of the cavity itself is readily calculated from a measurement of its diameter, by the formula

$$A = 2\pi r\,(r - \sqrt{r^2 - R^2})$$

where A is the area of the spherical indentation, r the radius of the ball, and R the semi-diameter of the indentation as measured on the original surface of the specimen. The results are in table 11.

From the figures in this table it will be seen that the nine alloys do not differ very materially from one another as regards hardness; all the alloys for the present series lie between Nos. 9 and 13 of the Eighth Report, Nos. 1, 2 and 3 of the present series approaching No. 13 of the Eighth Report very closely. The fact, however, that none of the present alloys surpass No. 13 of the Eighth Report in hardness is somewhat remarkable in view of the decidedly greater hardness of these alloys as indicated by the results of tensile tests. The figures given by the scleroscope are, in the present case, very nearly proportional to the hardness numbers derived from Brinell tests.

(To Be Continued)